

Royal School of Mines.

LECTURES ON MINERALOGY—No. II.

[BY OUR SPECIAL REPORTER.]

"THE GEOGRAPHICAL DISTRIBUTION OF MINERALS IN EUROPE" formed the subject of Prof. SMYTH's second lecture on Mineralogy. He said it would be a very large but interesting subject to attempt to describe the general distribution of minerals over the surface of the earth; but in the consideration of the distribution of minerals in Europe there would be found much that was interesting, and also important, to those who have to deal with minerals practically, and with regard to the questions which arise between nation and nation. He alluded, in the first place, to several quaint theories which were held in former times concerning this subject, and traces of which may even now be found in the minds of some people. For example, there used to be a very strong impression that the precious metals and gems were to be found only—or, at any rate, much more abundantly—in tropical and sub-tropical countries. This is, perhaps, due somewhat to the fact that in early life we are imbued with terms and notions from eastern writings—the sacred writings, *Sinbad's Adventures*, *Arabian Nights Entertainments*, &c.—in which precious metals and gems figure largely. After the discovery of America this notion was exemplified by the fact that for long it was the West Indies and the eastern parts of the tropical regions of America to which search for these substances was directed. This belief, however, has been now entirely disproved by the discovery of gold in large quantities in Siberia, and still more recently in the alluvial deposits of California, and in New Zealand. The old belief was founded upon the facts of the day, the discovery of new facts has rendered it necessary for us to modify the belief. Again, with reference to the different varieties of coal: it used to be held not so very long ago that these were produced by nature only under certain parallels of latitude, belonging, in fact, to temperate regions, and that it was absent both from tropical and polar regions. But even if we limit ourselves to true coal of the carboniferous period this notion is incorrect; for, according to the accounts of Livingstone, there are places in Africa where true coal is found; in America an almost unbroken chain of coal fields extends from 30° N. to 47° N.; again, we are told of coal districts in South China, and they are known to exist in some of the islands of the East Indian Archipelago. These facts show that as regards both precious metals and coal we must take a larger view of the distribution than was formerly done.

GOLD.—The production of gold in Europe is very small when compared with the production of the American continent, or even when compared with savage districts, like unto that of the king of Dahomey; but the history of that production is very interesting. The lecturer believed there was a time when it might be said there was no country of Europe which did not produce gold, but that time was long since gone by, and there are very few places now where it is produced in tangible quantity. Why? For the simple reason that civilisation has existed for a longer period in Europe than in most districts of the world, and consequently the gold which lay about at the surface in sand and gravel and alluvial matter in beds of streams has long since been exhausted and worked out, to such an extent that the small quantities which chemists inform us exist in most river gravels are not worth working. There are signs and records that at one time extensive gold workings were carried on in the courses of the Rhine, Rhone, and Danube, but these have long since ceased to be of any importance. Not long ago there was excitement about the discovery of gold in Scotland, but the quantity was so small that of 500 men working there were not more than 10 made ordinary wages, while not half that number made anything over. A similar rush to Wicklow, in Ireland, at the beginning of this century was attended with similar results, and on the Continent just the same set of circumstances are found in several places. In Bohemia from 500 A.D. to 1100 A.D. a large population subsisted mainly by virtue of the gold workings in that district, and the signs of these workings remain along the banks of many of the rivers to this day. In Transylvania, again, at the foot of the Carpathians, although nearly all the rivers in some parts of their courses carry gold, yet the quantity is so small that at the present day no one except a few colonies of gypsies can find a subsistence by working it. And the same is the case in Turkey; none but the very lowest class of people, who are satisfied with the barest subsistence, can extract a living out of the present gold washings. And yet these are districts which in the days of Alexander the Great produced considerable quantities of gold. In the days of Pliny Spain and Portugal produced considerable quantities of the precious metals, but as the deposits were merely superficial, such energetic working as that bestowed by the Romans and their colonies in a few hundred years exhausted these districts. And speaking generally, it may be said of all European districts that it is only in exceptional places, such as difficultly accessible portions of the beds of streams, or certain places cut off from the actual bed of the stream, that remunerative workings for gold can hope to be carried on. Very different is the case with gold and silver mines, where the gold exists with substances which penetrate deep into the crust of the earth. We find that in the 13th and early part of the 14th centuries many of these places were working, especially in the Alpine districts, in parts of Austria and South Bavaria, but after the discovery of America many of them could no longer be advantageously carried on. In our own country at the present time we have one gold mine working, near Dolgelly, in Wales, where for a depth of 20 fms. below the surface tangible quantities of gold are brought up. And the lecturer knew of several similar places where persevering labour might hope to obtain a sufficient return to cover all reasonable expenses. On the Continent gold mines seem to cease till we come to the district south of the Carpathians, called *Dacia* by the Romans, and now called *Rumania*, where formerly extensive workings were carried on by numerous Roman colonies, and many of the mines are now working.

SILVER.—In the days of the Romans this metal was extracted in large quantities from southern lands, in some cases along with lead ores, in others *per se*. Among the districts which produce true silver ores we reckon Transylvania, North Hungary, Bohemia, Saxony, Spain (about 60 miles from Madrid, and again in the south-east portion of the Peninsula). Of the silver obtained from lead ores we English have considerable reason to be proud of the wonderful production of this country, partly in consequence of the bountiful manner in which Nature has favoured us, and partly as the result of the bold enterprising character of our fellow-countrymen. The principal lead-producing districts, yielding also silver, are these:—*Lanarkshire*, in Scotland; *Northumberland*, *Darham*, *Cumberland*, *Yorkshire*, and *Derbyshire*; *North and Central Wales*, and isolated mines in *Cornwall* and *Devon*; *South-East of Ireland*. These districts together produce a quantity of lead greater than any other country in the world, and, with the exception of Spain, greater than all the other countries of Europe put together. Spain has been highly favoured in respect of lead, and there are many points on which the Spanish workmen deserve great credit for the great development of the art of mining, and the way in which they have kept themselves to their work, in spite of the troubled condition of the country. The south-east district, not far from the *Sierra Nevada*, was very productive in the time of the Carthaginians and Romans, and perhaps of the Moors also, and is so still. There are also ancient districts in the neighbourhood of Athens where people have lately been making fortunes by working up the refuse of the old workers; and we must not forget *Sardinia*, where large quantities have been obtained from mines which were only just touched by the colonists in the time of the Romans.

TIN.—To the fact of the occurrence of tin in the remote parts of Cornwall we owe the visits of early traders which contributed so much to the civilisation of this country. The tinworks of that county have been continued from those early times down to the present day, although it is necessary in some instances now to go down to a depth of 2000 ft. to extract it. If we refer to the Continent we find that as regards tin there is nothing worth notice in any part of Europe. On the French coast opposite to Cornwall, in

the district of Brittany, a little tin is found, but in a recent tour the lecturer could not hear of a single mine working there. In passing the mountains separating Saxony from Bohemia there are a series of metal mines which produce tin, but in so minute a quantity that it makes no impression on the statistics of Europe. In the north-east corner of Portugal is a district very similar in character to that of Cornwall, and there are similar veins with tin, but on a much smaller scale.

COPPER.—A few years ago we in Great Britain had the command of the copper market, and for nearly 150 years we produced very much more largely than any other country. But the day has passed, and a remarkable change has come over the aspect of things. Our product has fallen off since the first Great Exhibition, partly from the reduction in value of copper from its use being restricted, and partly from the discovery of copper ores in other countries—Australia, Chili, &c. Our principal producing districts—Cornwall and Devon—do not produce one quarter what they used to do, and other districts also produce smaller quantities than formerly. No other country of Europe, however, has thriven by our misfortunes; besides Great Britain there is no great copper producing district in Europe.

IRON AND COAL.—These are more widely distributed than any other substances referred to; passing eastward, for example, we meet with them in Scotland and North England, Belgium, Westphalia, Silesia, and Bohemia. With regard to our iron ores we have in many cases so far exhausted the materials that they cannot practically be now obtained, inasmuch as the ores can be brought from other districts more cheaply. Large quantities of ore are thus brought from the coast of France near Bordeaux, being shipped to the Severn, the Mersey, and the Tyne. A still greater traffic was set up just before the Carlist war with Bilbao in iron ores. Further supplies are brought to us from Portugal, South Coast of Spain, the celebrated mines of Elba (which Virgil speaks of as the inexhaustible mines of Elba). Large deposits of magnetite in Sweden have long been famous for the production of the finest kinds of steel, and before long great efforts will probably be made to bring supplies of ore to this country from large deposits in the middle of Lapland, where there are mountains of ore, but up to the present time they have been held to be too far remote from shipping ports to be obtained.

The lecturer then indicated briefly the great interest of studying the connection of different races of man with the productions of different parts of the continents; how, for example, our own mining districts are mainly inhabited and worked by Celtic races, representing the original inhabitants of the country, who were gradually forced into the mountainous districts by invading tribes. Much the same thing can be seen in Hungary, where the original inhabitants—the Slavonic races—now occupy the mountainous and mining districts, having been driven from the lowlands by invading Magyars. And the same fact holds good in Turkey to a great extent, the mountainous regions to the west being peopled by the Slavs, mingled it may be with a few Albanians. Again, if we start from our country, which still produces more iron ore than any country of the world, across the Continent, we shall find a very curious diminution in the total quantity of valuable coal and iron ore produced, and at the same time a curious connection with the comparative advancement of the country. The countries which come next in point of production—France and Germany—are the two we should be inclined to put next in the scale of civilisation, but when once we pass beyond these the figures at once fall almost to nothing. Sweden and Norway are so thinly populated, and have such a lack of capital and fuel, that their total production is small, although some of the products are of high value. As regards Spain, the backwardness of the country is due in a great measure to the uncertainty and convulsions of the Government, together with a lack of steadily applied capital, and in Italy we may see the same to a great extent. The enormous area of Russia yields but a very small quantity of these products, and if we pass into Turkey the same is true to a great extent; at all events, the localities in which these minerals are remain undeveloped, so that we feel very uncertain whether they are there in any great quantity.

Lectures on Practical Mining in Germany.

CLAUSTHAL MINING SCHOOL NOTES—No. V.*

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SECTION I.

ON THE MODE OF OCCURRENCE OF THE USEFUL MINERALS OR MINERAL DEPOSITS.

IRREGULAR DEPOSITS.—A. *Stoekes* and *Stoekwerke*—These terms, for which we have no equivalents in the English language, are used by the Germans to denote a mineral mass which differs from the neighbouring rock, and has either an irregular, spherical, elliptical, or angular shape, or even somewhat flat or lenticular in form, appearing to have a strike and dip in certain directions, but generally possessing such a considerable thickness towards the middle, and being so irregular in shape, that by them the words "strike" and "dip" find a very difficult application.

According to many writers, and first among them Von Cotta, stoekes are divided into two classes—(1) *liegende stoekes*; and (2) *stehende stoekes*.

1.—As "*liegende stoekes*" are classed all those which in their form and position approximate, or show some resemblance, to a bed or bedded deposit whose greatest dimensions are parallel to the stratification of the surrounding rock. The following examples will serve to illustrate deposits generally considered as "*liegende stoekes*." *Rammelsberg*, near Goslar: The strata of the mountain *Rammelsberg*, which are chiefly *grauwacke*, belong to the Devonian formation, and consist of the following, commencing below, and coming upwards. *Clay-slates* (*Wissenbacher slates*), *grauwacke*, *marly*, and *quartzose slates*. The deposit lies in, and is completely surrounded by, the *Wissenbacher slate*; it has a lenticular shape, the greatest extensions being parallel to the surrounding strata. The principal strike runs E.N.E. by W.S.W., and the dip is about 45° S.S.E., but varies in the hanging branch to between 25° and 70°. The total length of the deposit is about 1800 ft., and possesses the enormous thickness of 350 feet. At a depth of 400 ft. below the surface the deposit throws out a very thick branch on the hanging side, which wedges out at a further depth of 150 feet. Towards the ends the deposit also appears to wedge out. In 1859, after driving an exploratory cross cut in the eastern end, at some distance from the principal adit, the deposit was again met with; but here its character was completely altered, being composed of numerous lenticular masses (chiefly of copper pyrites), which were deposited alongside below and over each other. Each lies in, and is completely surrounded by, the *Wissenbacher slate*—so that there is here no hanging and lying wall to the deposit. The position of these smaller lenticular masses is similar to that of the principal deposit—that is, parallel to the general stratification of the slate. The mass consists principally of copper and iron pyrites, and, as subordinate ores, *mispickel*, *galena*, and *zinc-blende* are found. The nature of the ore seems to change from the hanging to the lying wall, and also in the direction of the strike, copper and iron pyrites being found mostly next the hanging and *galena* next the foot wall.

The well-known deposits of magnetite iron at *Dannemora*, in Sweden, consists of separate lenticular-shaped masses, of varying size, which rest sometimes against and sometimes over and under each other. Together they form a stock-shaped deposit, whose principal strike and dip is in the same direction as that of the surrounding limestone and chloritic slate. The thickness varies between 20 and 60 yards, and has already been followed to a depth of 200 yards. The ore is a finely granular magnetic ironstone, con-

taining also calc spar and brown spar, which sometimes traverse the deposit and veins. Towards the boundaries iron and copper pyrites, *zinc-blende*, *galena*, *mispickel*, &c., occur in varying quantities. **STEHENDE STOEKES** are those whose greatest extent is quite independent of the surrounding rock. One may consider them as very irregular lodes. As examples of *stehende stoekes* may be cited:—

The *Stahlberg*, near *Musen*, which may be characterised as a very wide irregular lode, which traverses the *grauwacke slate*, its greatest length is about 170 yards; it sends off from three to six branch deposits, which dip in an opposite direction to that of the principal mass. The width varies from 20 to 30 yards; the offshoots are about 4 yards wide.

The copper deposit at *Fahlun*, in Sweden, which occurs in *mafic* and *calc slate*. It is a very irregular half-ellipsoidal shaped massive deposit, which grows narrower and even wedges out in some parts below. The deposit consists principally of copper and iron pyrites and quartz. There are several similar deposits close to the larger one. A layer of talc and chloritic minerals surrounds and penetrates the mass. The portions which penetrate into the mass are called by the Swedish miners "*skolar*." The width of the *skolar* varies often between 2 and 20 yards, and sometimes are even 40 yards wide.

Although we have divided *stoekes* into *liegende* and *stehende*, still many cannot be brought under either of the two classes. In the old clay-slates of Andalusia, in Spain, there are many large deposits of iron pyrites (containing a small percentage of copper pyrites) which at the surface have been decomposed, forming brown iron ore. The deposits generally occur in large lenticular masses.

The principal ores occurring in *stoekes* are iron and copper pyrites and other copper ores, various iron ores (especially *spathe*), and magnetic iron ores, iron glance as at *Elba*, *galena*, electric *clay*, *mine*, brown ironstone, and rock salt. The coal at *Crausot* and *Montchanin*, in France, occurs in stock-shaped masses—the former 65 yards wide, and the latter from 25 to 75 yards wide.

Stoekes are very often found on the limits between different strata, as is the case in the iron ore *stoekes* at *Stahlberg*, in the *Thuringian* forests, between granite and limestone; in the *calamine* *stoekes* in Westphalia, between limestone and slate; and the hematite *stoekes* in Cumberland and Lancashire, which occur in the great majority of instances on the top of the mountain limestone (where there is or has been a series of new red sandstone strata), in very irregular deposits, opening out sometimes like a regular vein, but often suddenly closed up. It seems very probable that the place of deposit has been opened out by water, the hematite being originally deposited as a carbonate, in which form it was thrown down partly, displacing the limestone, and partly in previously existing caverns.

Stoekes repeat themselves sometimes in the same strata, mostly without order, and then only when lying between different strata.

Stoekwerke are masses of rock which are impregnated with ore or traversed by numerous small veins, which cross and run into each other in all directions, in such a manner that it is necessary to work the whole mass of the rock in order to win the ore. Examples: At *Altenberg*, in the *Erzgebirge*, the granite mass is traversed by numerous small veins, from 1 in. to 8 in. in width, intersecting only at very acute angles, and are besides collected in groups, so that several occur very near one another. They consist chiefly of quartz, but contain *staurolite*, *tin ore*, *wolfram*, and *mispickel*. The tin ore is not confined to the veins, but occurs in the country rock, which is more or less impregnated with it. It is impossible to determine the limit between the quartz of the lode and the stanniferous quartzose country rock, so gradually do they merge into one another. The *Carlsberg Mine*, near *St. Austell*, in Cornwall, consists essentially of a decomposed, and, therefore, readily workable granite, which is traversed by numerous tin, quartz, and schorl veins, about 6 in. thick, which cross each other without faulting, and it is at their intersection that the schorl crystals are usually found.

B.—*Nests*, &c.—Under the term "*nests*" are grouped the smaller mineral deposits, of a more or less regular shape, which occur separately in the ground, and which may, to a certain extent, be considered a very strong *stoekwerke*.

Somewhat more irregularly shaped masses of ore, which are often due to a disturbance of former deposits, are classed under the name "*pockets*." They are often crevice-shaped spaces filled with clay, in which the ore is mixed. Bone ore and *clay iron ore* often occur in pockets.

C.—STREAM-WORKS AND SUPERFICIAL DEPOSITS.

1.—**STREAM-WORKS:** Like pockets of ore stream-works are produced from the disturbance of former deposits. Stream-works are heaped up mineral masses which have been formed by the weathering and denudation of rock, containing deposits of ore, and consist, therefore, of fragments of the most various shapes, sizes, and descriptions, amongst which the fragments of ore are more or less finely divided. In other words, stream-works may be considered as the result of a natural dressing process on a very large scale. As might, therefore, be expected, they are often richer than the original deposit, from which they are sometimes far distant, and to which they are sometimes very near; they are often covered by a deposit of turf, sand, clay, and the like. In some cases the deposits of stream-works are still going on, and in others the deposition has long since ceased. As might be expected from the mode of their formation, they are generally found on the sides of hills and mountains, in valleys and ravines, in beds of rivers, and in large plains.

Tin, as tinstone, occurs more frequently than any other ore in stream-works—in Malacca, Banca, Australia, Penzance, Cornwall, Saxony, and Bohemia, in the neighbourhood of granite rocks, which are traversed by tin veins. Gold is found in stream-works in the Western Ural Mountains, Australia, Brazil, California, Transylvania, Spain, Hungary, &c. Platinum, often with grains of chrome, titanite, and magnetic iron, in Brazil, Hayti, Borneo, and the Ural and Altai.

2.—As distinguished from stream-works, superficial deposits have been formed in the positions in which they are now found; they are generally the filling up of surface hollows, and are sometimes covered with a layer of alluvial earth. To this class belongs—

BOG IRON ORE.—This is generally the result of a deposition from ochery springs. The ore is usually mixed with peat, sand, and the like; the ore occurs porous or honeycombed, and often contains phosphoric acid in combination; it is found in *Lusatia*, *Brandenburg*, *Prussia*, *Pomerania*, *Lower Silesia*, *Westphalia*, *Poland*, and *Russia*.

PEAT.—This consists of the remains of dead plants, which, under favourable circumstances, allow of the growth of new ones, and thus after one crop of turf has been cut after some time another will have grown in its place, so that a regular consumption and reproduction can be kept up. The thickness of the deposit usually varies between 1 ft. and 10 ft., though others occur much thicker; in this latter case layers may often be distinguished, giving to the deposit a stratified appearance. Sometimes the deposit has only a slight covering of sand, and in other cases there may be a cover of alluvial strata as much as 50 ft. and more in thickness, as at *Mühlhausen*.

As a supplement to this first section we must consider those disturbances of the strata which have caused parts of strata to have been moved from their original position, and which are all included under the general name of "*faults*." In the following we shall chiefly follow Von Carnall as, perhaps, the best authority on the subject.

DEFINITION.—When two portions of strata are separated from each other by a cleft (which is filled with the neighbouring rock), and so that one portion lies higher or lower than the other, we call the cleft a "*throw*" or "*fault*." This definition holds true for throws of veins.

If we say that one portion has been moved to the right or left of the other we shall have an apparently correct definition, yet in reality the one portion of the vein lies higher or lower than the other. By every fault there are three things to be considered—the fault or cleft, the mass which fills it, and the position of the separated rock masses with regard to each other, which includes also that of the deposits, the lode or the seam of coal.

We shall first occupy ourselves with the fault or cleft, without taking into consideration the position of the neighbouring strata. The space separating two portions of strata is usually called a cleft, which, according to the idea of the person using the term, may be either hollow or filled, so that by a fault we understand the space included between the two adjoining sides of the separated rock masses. The position of such a fault is given (as by veins) by its strike and dip. The dip has the greatest inclination to the horizon

* Being Notes on a Course of Lectures on Mining, delivered by Herr Berggrath Dr. Von Gumbrecht, Director of the Royal Bergakademie, Clausthal, The Harz, North Germany.

* From JAMES FORREST'S "Abstracts of Papers in Foreign Transactions of Periodicals for the Proceedings of the Institution of Civil Engineers."

about 8d. per ton; and with only partial filling, 3d. per ton. Against this must be placed the saving from the suppression of underground fires, which are of common occurrence when this coal is got in pillar work. The loss of coal in safety pillars and roofs is about 15 per cent.; the latter cause of waste being diminished proportionally as the height worked in one stage is increased.

—H. B.: Oesterreichische Zeitschrift für Berg und Hüttenwesen.

MINING AND STOCK EXCHANGE NEWS OF THE WEEK.

Messrs. F. W. MANSELL and Co. (Sworn Stock and Share Brokers), 43 and 43A, Palmerston Buildings, Old Broad-street, write to us as follows:—

EXCHEQUER (Gold and Silver).—Shareholders even yet do not appear to comprehend the fact that their property is one of very considerable extent. The mine claims are—On the Buckeye No. 2 lode, 4000 ft.; on the Acacia lode, 2000 ft.; and on the Fremont and Saugatack lode, 600 feet, making a total of 6600 feet, whereas the largest area of any of the Comstock mines does not exceed 500 ft. The Exchequer Company also possesses 160 acres of excellent woodland on the top of the ridge and 600 acres in the valley and on hill-sides around the works. The mineral belt is a southern continuation of the geological occurrences of Mount Davidson, around which are found the Comstock mines. Prof. Raymond, the United States Commissioner of Mining Statistics, referring to the geological structure of the district, says that "the rocks are eruptive, composed of felspathic porphyry and volcanic tuffs;" and that "the dykes are not dissimilar to the outcrops of immense veins, like the Comstock, and in this way the impression seems to have been created that they are actually the continuation of the Comstock lode, especially since irregular ore bodies have been found in some of these dykes."

The developments at Exchequer may be accepted in further proof of this opinion, since the ore body at the tunnel level is 60 ft. long horizontally, and tapers towards the surface almost to a point, while increasing in length as depth is attained. There are two ore chutes, pitching in opposite directions, rapidly approaching each other, and widening or lengthening on the vein as they descend. Says Prof. Raymond, "The inference is obvious, and almost irresistible, that these are the upper points only of an irregular and much larger body, the main portion of which lies below."

Besides this vein, upon which, as already stated, the company own 4000 ft., it has 2000 ft. on the Acacia, which crops out below, having a similar easterly dip, but striking north-west and south-east. The two veins, therefore, converge towards the north, and in the main tunnel, 700 ft. from the mouth, a cross-cut of 15 ft. eastward has intersected a vein carrying stibnite and ruby silver. This is supposed to be the Acacia. This supposition is confirmed by the "croppings" of both veins, which are prominent at many points. Samples from the Acacia "croppings" assay \$70 in silver per ton, but the vein has not yet been explored. A tunnel, however, has been driven to strike it, starting at a point 120 ft. vertically below the floor of the hoisting works. This tunnel has been driven nearly 200 ft. in country rock towards the vein. By drifting along the vein, and cross-cutting at one or two points to the Buckeye vein, the ventilation and drainage of both mines will be greatly facilitated. This is a most important point, as apart from the value attaching to the Acacia lode, the work, when completed, will afford additional facilities for speedy and economical development.

The latest official advices state that the slope in the 100 had been driven 12 ft. during the week; the vein is 1 ft. 8 in. wide, good milling ore. No. 1 slope in the 200 ft. level, had been driven 10 ft. also in fair milling ore. The 400 ft. level face shows a vein of good ore 18 in. wide. The new foreman, sometime underground superintendent in the Virginia Consolidated, says, "He wishes no money if he don't supply our 18 stamps to their full capacity every day in the year, provided the manager gives him men enough." On Jan. 29 the mill was progressing to completion, and the battery was finished. The snow had prevented being taken up to the mine two heavy pieces of timber required for the hoisting works: when these two braces were taken up, the whole of the machinery would be completed. The lode increases in size and depth, and the manager steadfastly believes it will progressively enrich in quality. O'Hara expresses confidence that he will extract 85 per cent. of what is in the ore, and the manager thinks 90 per cent., adding, "the only limit to the quantity of ore obtainable from the mine, when the shaft has been sunk to the 1000 ft., will be that fixed by the number of men employed." The new hoisting-works just completed are capable of carrying the shaft to a depth of 1000 or 1200 ft.

ISABELLE (Gold and Silver).—Charles Kingsley never said anything more truly than when he said—Geology is the Science of Common Sense. All who have the gift of common sense may read the book of out-doors. Any standard of exclusiveness in geological observation other than the possession of the noble gift of common sense to follow where necessary from the known to the unknown is, whenever set up, a bar to the general progress, and to scientific progress a curse. It may even be a bar to merited material prosperity. The geography and approximate continuations of the world-famous auriferous slates of the Sierra Nevada of California, should have been determined, and become universal property, in outline at least, a great many years ago.

Where annually since 1849, 10,000 men of intelligence—chiefly miners—have been making sections of exploration across them, and several thousands have travelled along their whole length, and observed them in longitudinal profile, what cloud of darkness can it have been that prevented the light of the common intelligence from beaming forth in a common recognition of the facts?

The area of predominating granite was once, probably, pretty generally covered by slates—which were accordingly subjected to all the vicissitudes attending the uplift of a granite mountain core—that of the Sierra Nevada. The slates are mostly gone; they would naturally have been less thickly bedded so close to the middle age shore. Between the Oroville Table Mountain and Piety Hill (near Shasta city) gold mining district, the slate or gold formation, crosses Sacramento Valley, and is cut off, partly only exposed by the deep erosions of the upper Sacramento, being covered at the surface throughout this 50 miles of distance by a broad sheet of lava from Lassen and Shasta Peaks, the tabular cliffs of which, as plainly seen from the railroad, designate the shore line where these lavas broke into the Pliocene sea.

That the slate-forming muds were deposited in pretty deep water throughout a pretty long period of time we have good reason to believe, from their consistency and vast thickness. No careful geological measurement of the thickness in feet has ever been attempted with satisfactory results. Yet it would seem that in the extreme simplicity of the regularity of the bedding of the slates along the entire western slope of the range we should not find it difficult to hit upon the precise method of granite uplift whereby the off-shore mud strata became shaped into a dome of unparalleled sublimity, presenting to our view a base or section of at least 100 miles, and an altitude of at least 10,000 to 14,000 ft. The granite island centres, as they were then in the axis of the Sierra Nevada, before the uplift of these beds, had the same relation to the Pacific shore of the period that the granite Farallón Islands have to the Pacific shore of to-day.

Though the gold product of California has diminished necessarily since the "days of old, the days of gold, and the days of '49," yet it is far more considerable than most people imagine. For the past year the gold yield of California is roughly estimated at \$20,000,000, and this will be largely increased if from no other reason than the rapid and steady improvement of all kinds of machinery, and the application of advanced scientific principles to every branch of industry, thereby permanently lessening the cost of production.

In the Eastern Slope of the Sierra, adjoining Nevada, is the principal silver district of California. Silver Mountain is the prominent feature in this district—its mineral lodes are more numerous, some of them even of greater magnitude than the Comstock, while in the average richness of the ores the latter bears no comparison to those of Alpine. In the facilities for cheap working the Silver Mountain Mines are unsurpassed. The Carson river and its tributaries, which are principally fed by the Alpine snows, furnish a water-power

sufficient to drive thousands of stamps, to which the mineral ledges are in close proximity. The mountains are covered with the finest timber, and it is from this source, floated annually down the Carson, that the 40 companies working the Comstock lode obtain much of their timber.

Silver Mountain is a little north of east from San Francisco, distant about 350 miles; it is almost directly south from Virginia city, and its mineral belt is undoubtedly a continuation of that of which the Comstock is the principal lode—the same course magnetic north and south passing through and connecting both districts. The mineral districts of Alpine County are of far greater extent than that developed in and about Virginia.

I. X. L. (Gold and Silver).—The indications in the 200 ft. level point to the near approach of the bonanza, which made this mine famous in 1861, resulting in the establishment of the mining district of Silver Mountain. Referring to this point, the manager some time since wrote as follows—"Not only have we not yet reached this ore body, as to the existence of which there can be no doubt, for it yielded to the superficial scratching of those early days, from a space only 40 ft. long by 22 ft. high, ore which milled at Silver Creek, now the Exchequer Mill, over \$50,000; not only have we not yet reached this ore body, but our new works have not yet extended into the original I. X. L. location, the conformation of the ground requiring, and economical working demanding, that the engine-shaft should be sunk on the Buckeye portion of the ground."

The latest information states that the 200 north is in 435 ft. from the cross-cut, and the manager is glad to say, "with every indication of getting into a paying body of ore at no distant day." The lode now is running in the drift, as on the top, considerably west of north, with well-defined walls, 7 ft. wide, dipping east. The rise under the O. K. is up 84 ft., and in very hard quartz; lode 10 ft. between walls. The Buckeye adit, which takes the shaft-water 35 ft. from the hoisting-floor, now 111 ft. north from the shaft, has turned out five carloads of good ore.

EBERHARDT AND AURORA.—The Eureka Sentinel has the following:—

We congratulate our White Pine neighbours on the fine showing of the above mine at the half-yearly meeting of the directors in London. The mine is out of debt, and \$260,000 in the treasury, a portion of which was set aside for a fund to insure the completion of the incline and tunnel. There were 8000 tons of ore taken from the mine, and prospects of a further extraction. Capt. Drake was highly complimented on his able management, a fact which will be heartily endorsed by all Fognoniers. We are sorry to learn that the hopes of the directors in relation to keeping the working force employed during the winter months were not realised, late advices from Hamilton announcing the discharge of 35 miners. This will only be temporary, and the re-establishment of good roads and pleasant weather will be a signal for their re-employment. There is a big vein down in the bowels of Treasure Hill, and when that incline reaches it Hamilton will boom as of yore. We hope that time is near at hand, for the men who have laboured with the place through its falling fortunes deserve a recompense for their faith and perseverance.

We find from other sources that during this long and successful run of more than eight months there were but few stoppages, never more than a couple of days at a time. It is now shut down for the winter, and will undergo complete overhauling. The total product last year was \$550,000. Some 35 men have been discharged from the mines, only a sufficient force being retained to push on the incline, and those employed on the tunnel. The White Pine News says, "This is to be regretted, more particularly as everyone expected the company would keep on a full force all winter. Many of the discharged men left this week for Eureka, Austin, and other localities."

FLAGSTAFF (Silver).—This mine seems likely to re-occupy its former prominent position, and there appears to be the best reason to believe that this time the results of the success will pass into the shareholders' pockets, and that the success will be upon a scale satisfactory to all connected with the property. The mine is situated in Little Cottonwood, the most prominent district of the Wasatch. Many of the mines near the summit of the mountain are 10,000 ft. above sea level. The canyon is a deep gorge about 15 miles long, and opens out west into Jordan Valley, 15 miles south of Salt Lake City. The lower portions of the canyon present some grand scenery where it cuts through the great dome of granite that occupies the central axis of the upheaval. In the Flagstaff, the ore is found in bedded deposits between the floors of limestone, or in the contact line between beds of different character. The footwall consists of a white crystalline limestone, and a dark shaly impure limestone hanging wall. The strike being north-west and south-east, and dip north-east of 40° to 60°. The gangue-stone is a brecciated zone of silicious limestone, varying in width from 30 to 100 ft.; the ore occurs irregularly in pipes, bonanzas, and segregated beds, penetrating the crushed zone in various directions, but the ore in most part is confined to the upper or hanging-wall side of the metal-bearing zone.

As regards the developments of its ore deposits, Utah is advancing with great rapidity. It is now scarcely 10 years since the first discovery of precious metals was made, yet a depth of over 1000 ft. has been gained in six mines, and over 30 have reached 500 ft. from the surface. The causes of this rapid development are to be found in the great size of the ore deposits, the comparative softness of the country rock, and the ease with which the mineral is reduced. What may be termed the native product—silver-lead ore—is offered and bid for in lots of 1000 and 1500 tons, and the contracts between mineowners and smelters, if there be contracts, are on the basis of hundreds of tons per month.

When one enters Salt Lake City, the immediate and overwhelming impression is that you are in a mining centre. Offices of mining and smelting works are to be seen everywhere, and by the doors and in the windows are huge specimens from the mines. The banks are provided with handsome and well filled cabinets, the hotels the same, and at the railroad depots are to be found carloads of incoming ore, or outgoing bullion. Everywhere are signs of the mines—the citizens can talk intelligently of their main industry. A visitor to Salt Lake City is immediately impressed with the notion that the Gentile merchants are building up their trade on a good solid foundation—the mines, and are not afraid to let outsiders see their bonanzas.

PATELEY BRIDGE (Lead).—The report this week states that the 30 east on Rake vein is of a most congenial character, more than 6 feet in width, intermixed with carbonate of lead, quartz, and blue ore, and from all appearances, the manager believes, they are bordering on a general deposit of metal. The 30 west is opening out wider, so much so that a considerable portion has to be left standing to the south, and the leading part on the footwall, which is being followed, produces fine ribs and patches of ore. The south cross-cut in the 20 west to cut Lumb vein is letting out more water, proving the proximity of the vein. A metal pitch has been let behind the forebreast on the new vein discovered some time since; two men have taken this pitch at 70s. per bing of clean ore. Fielding's in the roof is worth 15s. per fathom for lead ore; the metal pitch, its top part of bed, is producing 25 cwt. of lead ore per fathom. The Sun vein going east from the bottom of the new shaft is 5 feet wide, consisting of quartz, blende, gossan, carbonate of lead, and blue lead ore—together worth about 15s. per fathom.

WEST PATELEY BRIDGE (Lead).—The manager writes that the vein in the rise in the back of the 56 has again improved, and that other parts of the mine are unchanged. Dressing operations going on steadily. At the special meeting, on Wednesday, it was unanimously resolved that the 5s. shares should be subdivided into 1s. shares, so that, instead of 4000 shares of 5s. each, there are now 20,000 shares of 1s. each. It was officially stated that "the mine is opening out in a most encouraging manner."

GENERAL MARKETS.—Business throughout the week has been very inactive; towards the close, however, a little improvement was observable in a few instances, but there is as yet great slowness to respond to the more favourable political indications reported from the Continent, among which may be enumerated more particularly the conclusion of peace between Turkey and Serbia, the prospect of a like arrangement with Montenegro, and the pacific tone of the German Emperor's speech.

KINGSTON CONSOLS.—It will be seen from the weekly reports that these mines are continuously progressing, and the monthly sales or ore regularly increasing both in quantity and value. The sampling for March 1 will produce over 4000; that of Feb. 1 was 3754. All the ore sold has been taken from the 15 fm.

level, and they have now commenced cross cutting in the 30, in which the lode is very rich; so that we look forward to this turning out a great and profitable mine.

NOTES ON CHILI—COQUIMBO.

At the port there is little to see, so let us take the train inland and have a peep at a South American copper smelting work, and go down one of the oldest and richest copper mines of "El Dorado," "the golden land." As in the natural order of things the copper has to come out of the mine ere it can be smelted, we shall take the mine first in order. A ride of five miles from the railway terminus, at a clean little town styled "La Serena," the serene city, because I suppose everything there is always "all serene," brings us to the foot of a quebrada or valley, and right before us, half-way up the hill, we see a chimney sticking out of the hill-side, like as if a Vulcan had his smith-shop below. This is for the mine engine, as we shall presently see. The entrance soon faces us, being through a long narrow tunnel, run right into the face of the hill, and when we crawl through to the end we find this mine engine hard at work hauling up an inclined plain the trucks of ores. Above us are 150 metres of solid rock, and below us the mine is sunk to as great a depth. The descent is made by ladders, with a landing every 20 ft., and to an inexperienced person the descent and ascent by means of these are most fatiguing, and cause next day a stiffness of the leg muscles hardly to be credited till experienced. The ore is worked in galleries, and I believe runs in veins, the proper following out of these lodes forming the most important part of the duty of the mine captain. The miner brings what he has cut out to the mouth of the shaft, where it is drawn up by the "bogies" I have mentioned, and according to the percentage of pure copper contained in his lot, and according to the quantity he cuts out, so is the miner paid, a royalty being reserved to go to the owner of the mines. The miners work eight hours at a time without stopping for food or anything, and night and day, Sunday and Saturday, a gang is always hard at work. They seemed to me an especially hardy lot of men, having great powers of endurance and of hard work; the upper men, foremen and managers, are chiefly Cornishmen, whose experience in copper mining, very often largely inherited from their fathers, makes their skill invaluable out here, and consequently their services are very well remunerated. The ore is found in many forms, chiefly as sulphide, with more or less sulphur in it, and is divisible into two great classes: (1) those containing much sulphur styled *Bronce amarillo* or yellow metal, and (2) those containing little or no sulphur, generally called *Bronce Colorado* or red metal. For a long series of years these sulphur ores were considered useless and too poor to be worked, till the proprietor of this very mine, the great copper smelter and millionaire, Don Carlos Lambert, of Swansea, England, himself a first-rate chemist, taught them the process of working up these poorer ores, and further showed the benighted individuals how to utilise this excess of sulphur by subliming it and making sulphuric acid, from which still further sulphate of copper is procured, a commodity much in demand out here as a factor in the extremely beautiful process of extracting silver from its ores by amalgamation, a most interesting application of science to the arts, a few remarks on which I should like to endeavour to lay before your readers a little later on.

As regards the copper mine now in our "mind's eye," suppose we have got the ores out of the mine in lumps of the size of one's fist. Then by a little boy, who, I am told, on merely looking at the ore, can estimate the percentage of pure copper to within a few decimals, these crude ores are sorted into several heaps, the richest of which may contain 10 to 15 per cent. of metallic copper, and the poorest, perhaps, 3 per cent. By means of powerful crushers they are reduced to powder, and being held in suspension, are floated along in a stream of water to a large pond, precisely like a fountain's basin. The water, impregnated with these almost impalpable particles of ore, is led up into the centre of this pond through a pipe, branching out into four jets, which jets are made to revolve, and up this pipe, and through these revolving jets, the water with the ore in it runs, pouring itself out of them into the centre of the basin. Then the simplicity and ingenuity of this contrivance manifests itself; for, by the simple means of bringing the ore, suspended in water, through these rotary pipes, it is spread out thin, the water flowing gently over the whole surface of the pond, and as the ore sinks, owing to the law of gravity, it assort itself into three marked kinds, the heaviest and coarsest particles sink first nearest the centre of the bubble, next a more pure mixture, and outside is the finest and purest of the ore. The two better kinds are again floated and spread out in another bubble, and the process as described repeated—say, six times—until in the last pond, a vastly improved powder is to be found. So effective is this inexpensive operation, that with a little water and a turbine the powdered ore is raised from 3 per cent. up to 20 per cent. Having been spread out to dry in the sun, this fine copper dust is put in skins and on mule-back to be conveyed to the smelting works, distant some six miles. To visit these we again bestride our "Rosinantes," and by another route return to our quarters, close to the works, which are situated on the face of a hill, the railway from Coquimbo running into them. I was much struck by a remark made to me by the manager of this establishment, to the effect that, even in the comparatively short space of time he had been resident in that neighbourhood, he had most distinctly observed a decided change for the worse in the nature of the climate, and the extent and amount of rainfall, which has diminished.

On looking back on the features of this part of the country near Coquimbo, after my experience of the deserts further north, I think I can trace the workings of the hand of Nature around La Serena and Northern Chili, itching to convert it by her active agents—never at rest out here—into something of the same howling wildernesses; many parts around showing signs of having seen better things now are but *revenue aux moutons*. Here again I must have recourse to the Gladstonian No. 3, and say that there are three chief products manufactured in these extensive copper works of La Compania. These are—(1) semi-pure metallic copper, containing 50 per cent. of pure metal, and commercially known as *regulus*; (2) metallic copper, almost pure; (3) sulphate of copper crystals, chemically pure. The powdered ore, as it is after the washing process I have mentioned, is put into a calcining furnace, along with a flux of lime, and having been roasted for a requisite number of hours, after having been several times skimmed, the furnace is tapped, and out flows a stream of liquid copper, hissing and sparkling as it runs lava-like into the moulds prepared to receive it. These blocks of metal, ere quite cool, are carried alongside and plumped into a pond, where, having lain a day, the water it run off, and we have before us a black-looking powder. This is *regulus*. Gathered up in this powdery form the ore is again submitted to the furnace's action, and after some one or two heats is run out in the form of metallic copper, of 96 to 99 per cent. purity. This ends this part of the process, and we have now copper ready for shipment to European markets. As I have said, the surplus sulphur fumes are led from the calcining furnaces to a sulphuric acid chamber, and through the use of nitrate of soda are, by a common process, converted into sulphuric acid. Incorporated with the poorer ores this acid converts a large portion of the copper into sulphate, and by repeated evaporations and re-crystallisations a concentrated solution is obtained, which on cooling, deposits most beautiful blue crystals. Thus is the sulphur, hurtful in metallic copper, utilised from the rich ores into cupric sulphate, and used to work up the poor ones, an arrangement conducing immensely to the profit of the miner and smelter the first to adopt the arrangement.

Leaving Coquimbo, we next call a halt at Chanaral, somewhat further north along the coast. Here another great miner and smelter has his works, and I was permitted to feast my eyes on his immense stock of manufactured copper, valued at 300,000 sterling—a good stand-by in case the markets should prove restive. Connected with his works there is a railway, in one respect the most curious anywhere, for along the track one can enjoy a sail, there being on part of the line a steady breeze constantly blowing in one direction, which natural phenomenon is taken advantage of, and a sail being hoisted, away the cars go, spinning along at times up a steep incline along a plain. I have heard that in China they fly something like this on their barrows, but I could hardly have believed such an arrangement possible on a railway had I not seen the gear and sail

HALF-YEARLY FOREIGN AND COLONIAL MINING SHARE LIST, JULY TO DECEMBER, 1876.

SHOWING THE PRICES OF THE LONDON MARKET ON THE 1st JULY AND THE 30th DECEMBER, 1876, AND THE LOWEST AND HIGHEST PRICE FOR THE SIX MONTHS
JULY TO DECEMBER INCLUSIVE.

CONTRIBUTED BY MR. EDWARD ASHMEAD, LONDON MINING AGENT AND ACCOUNTANT, 62, CORNHILL, LONDON, E.C.

THE FOLLOWING LIST EMBRACES THOSE MINES IN WHICH DURING THE PAST SIX MONTHS THERE HAVE BEEN FREQUENT DEALINGS AND CONSTANT QUOTATIONS, AND NOT THOSE IN WHICH THERE HAVE BEEN BUT FEW TRANSACTIONS AT LONG INTERVALS. SHARES HAVING THEIR TRANSACTIONS EXCLUSIVELY IN PROVINCIAL MARKETS WILL NOT BE FOUND IN THIS LIST.

MINE AND COUNTRY.	Mineral.	Shares.	Paid.	Price, July 1, 1876.	July.		August.		September.		October.		November.		December.		Price, Dec. 30, 1876.
					Lowest.	Highest.	Lowest.	Highest.	Lowest.	Highest.	Lowest.	Highest.	Lowest.	Highest.	Lowest.	Highest.	
FRANCE.				£ s. d.													
Pontgibaud*	Silver-lead ...	10,000	20 0 0	16 to 18	16	18	16	18	16	18	16	18	16	18	16	18	16 to 18
ITALY.																	
Pestarena	Gold	80,000	3 0 0	1/4 1/2	1/4	1/2	1/4	1/2	1/4	1/2	1/4	1/2	1/4	1/2	1/4	1/2	1/4 1/2
RUSSIA.																	
Russia Copper	Copper	30,000	10 0 0	2 1/2 3	2 1/2	3	2 1/2	3	1 1/2	2 1/2	1 1/2	2 1/2	1 1/2	2 1/2	1 1/2	2 1/2	2 2 1/2
SPAIN.																	
Alamillos*	Lead	35,000	2 0 0	1 1/2 2 1/2	1 1/2	2 1/2	2	2 1/2	1 1/2	2 1/2	1 1/2	2 1/2	1 1/2	2 1/2	1 1/2	2 1/2	2 2 1/2
Fortuna*	Lead	25,000	2 0 0	5 1/2 6	5 1/2	6	5 1/2	6	5 1/2	6	5 1/2	6	5 1/2	6	5 1/2	6	6 1/2 6 1/2
Linares*	Lead	15,000	3 0 0	5 1/2 6	5 1/2	6	5 1/2	6	5 1/2	6	5 1/2	6	5 1/2	6	5 1/2	6	6 1/2 6 1/2
Rio Tinto	Copper	225,000	10 0 0	4 1/2 5 1/2	4 1/2	5 1/2	4	5 1/2	4	5 1/2	4	5 1/2	4	5 1/2	4	5 1/2	4 1/2 4 1/2
Do. 7 p. ct. Mort. Bonds.	Copper	49,350	20 0 0	13 14	12 1/2	14	13	14 1/2	12 1/2	14	12 1/2	13 1/2	12 1/2	13 1/2	12 1/2	14 1/2	13 1/2 14 1/2
Do. 5 p. ct. Spanish Cou- pon Bonds	Copper	£2,123,000	100 0 0	55 57	55	58	56	64	58	62	55	60	56	60	57	63	61 63
Tharsis*	Sulphur, &c. ...	68,230	10 0 0	—	—	—	—	—	—	—	20 1/2	22	20	24	21	23	21 23
SEYDIA.																	
Eberhardt and Aurora* ...	Silver	27,528	10 0 0	9 9 1/2	8 1/2	9 1/2	8 1/2	9 1/2	8 1/2	9 1/2	8 1/2	9 1/2	7 1/2	8 1/2	7 1/2	9 1/2	8 8 1/2
Richmond*	Silver, lead, gold	54,000	5 0 0	8 8 1/2	8	9 1/2	8	9 1/2	8	9 1/2	8	9 1/2	8	9 1/2	8	9 1/2	8 8 1/2
South Aurora	Silver	60,000	5 0 0	8 8 1/2	8	9 1/2	7s.	10 1/2	8	9 1/2	8	9 1/2	8	9 1/2	8	9 1/2	6s. 3d. 8s. 9d
COLORADO.																	
Colorado Terrible	Silver-lead ...	21,000	5 0 0	1 1/2 1 3/4	1	1 3/4	1	1 1/2	1	1 1/2	1	1 1/2	1	1 1/2	1	1 1/2	1 1 1/2
CALIFORNIA.																	
Birdseye Creek	Gold	15,000	4 0 0	3 1/2 4	3	4	3	4	3	4	3	4	3	4	3	4	3 3 1/2
Blue Tent	Gold	30,000	5 0 0	3 3 1/2	3	3 1/2	3	3 1/2	3	3 1/2	3	3 1/2	3	3 1/2	3	3 1/2	3 3 1/2
Clear Creek	Gold	40,000	5 0 0	3 3 1/2	3	3 1/2	3	3 1/2	3	3 1/2	3	3 1/2	3	3 1/2	3	3 1/2	3 3 1/2
Eschschuer	Gold	100,000	1 0 0	1 1/2 2 1/2	1 1/2	2 1/2	1 1/2	2 1/2	1 1/2	2 1/2	1 1/2	2 1/2	1 1/2	2 1/2	1 1/2	2 1/2	1 1 1/2
LX L	Gold	100,000	1 0 0	1 1/2 2 1/2	1 1/2	2 1/2	1 1/2	2 1/2	1 1/2	2 1/2	1 1/2	2 1/2	1 1/2	2 1/2	1 1/2	2 1/2	1 1 1/2
London and California ...	Gold	165,000	2 0 0	1 1/2 2 1/2	1 1/2	2 1/2	1 1/2	2 1/2	1 1/2	2 1/2	1 1/2	2 1/2	1 1/2	2 1/2	1 1/2	2 1/2	1 1 1/2
Serra Buttes*	Gold	122,500	2 0 0	1 1/2 2 1/2	1 1/2	2 1/2	1 1/2	2 1/2	1 1/2	2 1/2	1 1/2	2 1/2	1 1/2	2 1/2	1 1/2	2 1/2	1 1 1/2
Do. Pumas Eureka*	Gold	140,625	2 0 0	1 1/2 2 1/2	1 1/2	2 1/2	1 1/2	2 1/2	1 1/2	2 1/2	1 1/2	2 1/2	1 1/2	2 1/2	1 1/2	2 1/2	1 1 1/2
Sweetland Creek*	Gold	15,000	4 0 0	1 1/2 2 1/2	1 1/2	2 1/2	1 1/2	2 1/2	1 1/2	2 1/2	1 1/2	2 1/2	1 1/2	2 1/2	1 1/2	2 1/2	1 1 1/2
OREGON.																	
Oregon, Preference	Gold	3,000	4 0 0	4 4 1/2	4	4 1/2	4	4 1/2	4	4 1/2	4	4 1/2	4	4 1/2	4	4 1/2	4 4 1/2
UTAH.																	
Chicago*	Silver	13,225	10 0 0	6 1/2 6 3/4	5	6 3/4	5	6 1/2	5 1/2	6	6	7 1/2	6	7 1/2	5 1/2	6 3/4	5 1/2 6 1/2
Emma	Gold and silver	50,000	20 0 0	1 1/2 2	1 1/2	2	1 1/2	2	1 1/2	2	1 1/2	2	1 1/2	2	1 1/2	2	1 1/2 2
Flagstaff	Silver	30,000	10 0 0	1 1/2 2	1 1/2	2	1 1/2	2	1 1/2	2	1 1/2	2	1 1/2	2	1 1/2	2	1 1/2 2
Last Chance	Silver	20,000	5 0 0	1 1/2 2	1 1/2	2	1 1/2	2	1 1/2	2	1 1/2	2	1 1/2	2	1 1/2	2	1 1/2 2
Tecoma	Silver	30,000	10 0 0	1 1/2 2	1 1/2	2	1 1/2	2	1 1/2	2	1 1/2	2	1 1/2	2	1 1/2	2	1 1/2 2
MEXICO.																	
Alma and Tiroto*	Silver	130,000	1 0 0	1 1/2 2 1/2	1 1/2	2 1/2	1 1/2	2 1/2	2 1/2	3	2 1/2	3	2 1/2	3	2 1/2	3	2 1/2 3
United Mexican	Silver	43,372	28 15 0	1 1/2 2 1/2	1 1/2	2 1/2	1 1/2	2 1/2	2 1/2	3	2 1/2	3	2 1/2	3	2 1/2	3	2 1/2 3
NICARAGUA.																	
Chontales	Gold	62,827	2 0 0	6s. 8s.	5s.	8s.	5s.	8s.	5s.	10s.	9s.	11	9s.	12s. 6d.	10s.	13s.	10s. 12s.
Javali	Gold	46,995	2 0 0	6s. 8s.	5s.	8s.	5s.	8s.	5s.	10s.	9s.	11	9s.	12s. 6d.	10s.	13s.	10s. 12s.
VENEZUELA.																	
New Quibada	Copper	66,000	5 0 0	3 1/2 4	3 1/2	4 1/2	3 1/2	4 1/2	2 1/2	4 1/2	2 1/2	4 1/2	2 1/2	4 1/2	4	4 1/2	3 1/2 4
UNITED STATES OF COLUMBIA.																	
Frontino and Bolivia* ...	Gold	54,678	2 0 0	1 1/2 2 1/2	1 1/2	2 1/2	2	2 1/2	1 1/2	2 1/2	1 1/2	2 1/2	1	2	1 1/2	2	1 1/2 2
Mohabar	Gold	75,000	1 0 0	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Majaso	Gold	40,000	1 0 0	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CHILE.																	
Don Pedro North del Rey ...	Gold	100,000	0 16 0	1s. 6s.	1s.	6s.	1s.	6s.	1s.	6s.	1s.	6s.	1s.	6s.	1s.	6s.	1s. 6s.
Santa Barbara*	Gold	40,000	0 10 0	1 1/2 1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2 1 1/2
St. John del Rey*	Gold	£253,900	Stock	340 360	330	360	325	360	325	360	330	360	330	360	315	350	315 325
CHILI.																	
Codels de Chili	Silver	16,000	5 0 0	6 6 1/2	5 1/2	6 1/2	5	6 1/2	4 1/2	5 1/2	4 1/2	5 1/2	5	5 1/2	4 1/2	5 1/2	5 5 1/2
Pamulillo	Copper	50,000	4 0 0	1 1/2 2 1/2	1 1/2	2 1/2	1 1/2	2 1/2	1 1/2	2 1/2	1 1/2	2 1/2	1 1/2	2 1/2	1 1/2	2 1/2	1 1/2 2 1/2
San Pedro	Copper	25,000	2 0 0	1 1/2 2 1/2	1 1/2	2 1/2	1 1/2	2 1/2	1 1/2	2 1/2	1 1/2	2 1/2	1 1/2	2 1/2	1 1/2	2 1/2	1 1/2 2 1/2
ARGENTINE REPUBLIC.																	
Argentina	Gold	12,000	5 0 0	6 6 1/2	5 1/2	6 1/2	5 1/2	6 1/2	5	6 1/2	5 1/2	6 1/2	5 1/2	6 1/2	5 1/2	6 1/2	5 1/2 6 1/2
AUSTRALIA.																	
Australian Mining*	Copper	18,315	7 0 0	1 1/2 2	1 1/2	2	1 1/2	2	1 1/2	2 1/2	1 1/2	2 1/2	1 1/2	2 1/2	1 1/2	2 1/2	1 1/2 2 1/2
Put Philip	Gold	97,500	1 0 0	1 1/2 2 1/2	1 1/2	2 1/2	1 1/2	2 1/2	1 1/2	2 1/2	1 1/2	2 1/2	1 1/2	2 1/2	1 1/2	2 1/2	1 1/2 2 1/2
Scottish Australian*	Coal, &c. ...	120,000	1 0 0	1 1/2 2 1/2	1 1/2	2 1/2	1 1/2	2 1/2	1 1/2	2 1/2	1 1/2	2 1/2	1 1/2	2 1/2	1 1/2	2 1/2	1 1/2 2 1/2
Do. New*	Coal, &c. ...	80,000	0 5 0	1 1/2 2 1/2	1 1/2	2 1/2	1 1/2	2 1/2	1 1/2	2 1/2	1 1/2	2 1/2	1 1/2	2 1/2	1 1/2	2 1/2	1 1/2 2 1/2
Yorke Peninsula	Copper	75,000	1 0 0	1 1/2 2 1/2	1 1/2	2 1/2	1 1/2	2 1/2	1 1/2	2 1/2	1 1/2	2 1/2	1 1/2	2 1/2	1 1/2	2 1/2	1 1/2 2 1/2
Do. Preference	Copper	40,000	1 0 0	1 1/2 2 1/2	1 1/2	2 1/2	1 1/2	2 1/2	1 1/2	2 1/2	1 1/2	2 1/2	1 1/2	2 1/2	1 1/2	2 1/2	1 1/2 2 1/2
NEW ZEALAND.																	
New Zealand Kapanga ...	Gold	20,000	5 0 0	1 1/2 2 1/2	1 1/2	2 1/2	1 1/2	2 1/2	2 1/2	3 1/2	2 1/2	3 1/2	3 1/2	4 1/2	3 1/2	4 1/2	3 1/2 4 1/2
SOUTH AFRICA.																	
Cape Copper*	Copper	20,000	7 0 0	37 42	35	42	35	42	34	40	35	40	37	40	33	41	38 40

Those marked with a * paid Dividends in 1876. The following Foreign Mining Companies also paid Dividends in 1876, of which the shares are seldom or ever quoted—the Copiapo, in Chili; Libiola, in Italy; New Zealand Manganese, in New Zealand; Victoria (London), in Australia; Western Andes, in Columbia; and the West Prussian, in Rhenish Prussia.

ready to set. I fancy, however, your readers must ere now have had a sufficient dose of copper. I shall have pleasure in laying before them in my next a sketch of silver workings of the Caracoles silver mines, and give some notes of those natural deposits of nitrate of soda found in the interior of Bolivia and Peru, the feature of South American typography, the most essentially peculiar and characteristic. —Glasgow Herald.

BLACWELL PARK RED HEMATITE IRON AND COAL MINING COMPANY, CARLISLE (Limited).—It will be seen from our advertising columns that the shareholders in this company are to have a general meeting on Monday, March 5. This company, who have gone about their operations in a very unpretentious way, feeling that the important interests they represented would not be served by publicity in the earlier steps of their career, were rewarded for their patient industry by the discovery in December last of a seam of hematite, 6 ft. thick, on the Burthwaite property. This discovery (very unexpected in a geological point of view) will have a very important effect on the general industries of the locality, as coal is supposed to exist within a few miles of, if not on the very property,

and the contiguity of Blackwell Park to the London and North-Western and Midland Railways, with the fact of its being the nearest known hematite field to the Scotch and Middlebrough markets, renders it perhaps one of the most important mineral discoveries that has occurred for many years in any district of England.

WEST WHEAL SETON, on the whole, is looking exceedingly well, and handsome profits are expected. One of the points in the western part of this mine is producing 12 tons of rich copper ores per fm., and they expect to reach one or two very important points shortly. An independent inspection of the mine has recently been made by Capt. T. Hodge, of Wheal Grenville, who has given a very glowing report. This inspection was made in order to test the estimate of the managing agent as to the productive value of the property. The report has been circulated amongst the adventurers, and in it Capt.

BRITISH MINES.

With this week's Journal a SUPPLEMENTARY SHEET is given, which contains: Original Correspondence: Electricity for Blasting and Signaling in Mines; Colliery Management and Dividends; The Late Mine Act, and Colliery Managers; Spontaneous Combustion and Explosion on Board of Coal-carrying Ships—Patent Fuel (A. Vassard); Mining Explosives, and their Cost—Organisation of the Mining Interest—Richmond Mining Company—An Enigma—The Emma Mine—Vineberg Copper Mining Company—Cardiganshire Mine—A.D. 1877—No. IV. (Absalom Francis); Dartmoor—Mineral Deposits and Railway—No. II.; Cornish Mining (C. Bawden); the Mining Interests of Cornwall (R. Tredinnick); Low-Priced Mining Shares, and Hints to Investor (John R. Pike); Two Neglected Securities; Science in its Application to Mining (R. Knapp); Outlines of Geology—Barnard's Promoters' Company, Limited—Peden and Area Mines, and Mr. Granville Sharp (W. Tregay)—New Stone and Ore Breaker—Registration of New Companies—Foreign Mines—Almada and Tiritio Consolidated Silver Mining Company—American Handbook of Finance—Foreign Mining and Metallurgy—Meetings of Aruba Island, English and Australian, Emma, Flagstaff, Wheel Grenville Botallack, West Tolgus, Phosphor Bronze, &c.

TO THE METAL TRADE.

FOR COPPER, TIN, LEAD, &c., apply to—
MESSRS. PELLY, BOYLE, AND CO.,
SWORN METAL BROKERS,
ALLHALLOWS CHAMBERS, LOMBARD STREET, LONDON.
(ESTABLISHED 1849.)

The Mining Market: Prices of Metals, Ores, &c.

METAL MARKET—LONDON, FEB. 23, 1877.

IRON.	£ s. d.	£ s. d.	TIN.	£ s. d.	£ s. d.
Pig, GMB, f.o.b., Clyde.	2 15 0	2 15 7 1/2	English, ingot, f.o.b.	75 0 0	76 0 0
" Scotch, all No. 1.	2 17 6	3 0 0	" bars	75 0 0	76 0 0
Dars, Welsh, f.o.b.	6 0 0	—	" rebar	75 0 0	76 0 0
" in London.	6 12 6	6 15 0	Banco	71 0 0	—
" in Tyne or Tees.	8 2 6	8 7 0	Straits	72 0 0	—
" Swedish, London.	10 10 0	11 0 0			
Rails, Welsh, at works.	5 10 0	—			
Railway chairs	—	—			
" spikes	—	—			
Sheets, Staff, in London	9 5 0	9 10 0			
Plates, Staff, in London	9 5 0	—			
Hoops, Staff, in London	7 15 0	8 15 0			
Nail rods, Staff, in Lon.	7 10 0	8 2 6			
STEEL.					
English, spring	14 0 0	23 0 0			
" cast	25 0 0	45 0 0			
Swedish, keg	17 0 0	—			
" lag, same	17 10 0	18 10 0			
LEAD.					
English, pig, common	21 0 0	21 10 0			
" L.B. nom.	21 10 0	—			
" sheet and bar	22 0 0	22 12 6			
" pipe	23 0 0	—			
" red	23 10 0	—			
" white	28 0 0	29 10 0			
" patent shot	24 10 0	24 15 0			
Spanish	20 15 0	—			
QUICKSILVER.					
Flasks of 75 lbs., ware.	7 15 0	—			
SPELTER.					
Silesian or Rhenish	20 15 0	—			
English, Swansea	22 10 0	—			
Sheet zinc	24 10 0	26 0 0			

* At the works, 1s. to 1s. 6d. per box less for ordinary; 10s. per ton less for Canada; 12 6s. per box more than 100 quoted above, and add 6s. for each X. Terms—plates 2s. per box below tin-plates of similar brands.

REMARKS.—The aspect of our markets is unchanged, and business still continues on a limited scale, but it is hoped that the time is approaching when some improvement will be experienced. Before another week the first spring month will have commenced, and orders for Canada and Russia, and other Northern ports, will probably be given out, the season being earlier this year than usual. The slackness of business in the past must be made up by greater activity in the future, and prices are now so reduced that they do not interfere with consumption. Money is cheap and abundant for all legitimate purposes, and as long as this is so other impediments will gradually succumb. Supply and demand must, however, always regulate prices, but as the latter has already been very great depression in consequence of the accumulation of stocks producers are not likely to go on adding much more to them, and, therefore, any increased demand would greatly relieve the market, and speculators may, perhaps, soon begin to operate in anticipation of such an improvement. A little extra stock held over at low rates is not very burdensome, and does not cost a great deal, besides, when prices have been lowered by reason of unusually heavy stocks, that is often considered the most prudent course, but as the effect forward contracts, simply because statistics are bad, the chances being more in favour of an amendment than otherwise. The elements for a good business still exist, which in time will fully mature, but the state of political affairs has shaken confidence, and cast a temporary gloom over everything, and until some favourable turn is discernible in the East but few will have the courage to make a bold venture. At the same time holders are very reluctant to realise at current prices, as they leave a positive—in some instances a considerable—loss.

The Emperor of Germany's speech, however, should produce an improved feeling, as it gives the conviction that peace will be preserved amongst the Christian Powers, and in the interests of commerce it is most expedient that peace should be maintained, and as regards Turkey, Serbia, and Montenegro, the favourable negotiations now proceeding seem as if definite terms will be very shortly concluded between them, and as Turkey cannot expect to gain anything by entering upon a war with Russia, she may, upon mature reflection, grant the concessions which the European powers have demanded, especially as she must know by this time that she offers further resistance not even England would go to her rescue, and she would fall a prey to her bitter enemies.

COPPER.—The Wallaroo sale is over, and no good results has followed. In an ordinary year a sale of several hundred tons of copper is considered a good proof of the strength of the market, and would impart a stronger tone, and there is very little doubt that if the sale had been effected privately, as formerly when higher prices were obtained, instead of publicly, as now adopted, when lower prices have to be taken, the market would have been benefited, and especially the price of Wallaroo, but under the new order of things a contrary effect has been produced. The object of these public sales, doubtless, is to bring the price to the public, and if they are held with that intention, they have failed, for the bidding is generally confined to a limited number, and chiefly amongst those who make it their speciality. Had it not been for these public sales of Wallaroo the price of copper would probably have been higher, and not lower, as there was evidence of a better state of things dawned, but this sale has completely unsettled the market the last few days, and spoiled business for the present. Chill is mostly held for much higher prices, and the quantity for sale in second hands is very limited, and as the price is low speculators may be tempted to forward as there can be no very serious loss, if there is not much profit to be made at these rates. Low prices have invariably stimulated business, and there is no reason why it should not do so again. The course of the market during the week has been downward. On Monday g.o.b. was at 71s. on the spot; Wallaroo, 78s. 80s.; Barra, 77s. 10s. The charters were announced for the first half of February as 2600 tons. On Tuesday the price of Chill remained unaltered, the attention of the trade being directed to the Wallaroo sale. The price realised for cake was from 77s. 2s. 6d. to 77s. 12s. 6d., and 77s. 10s. to 77s. 12s. 6d. for Wednesbury. On Wednesday the market was easy for all kinds: Chill reduced to 70s. 10s. net, and 71s. forward; Wallaroo, 77s. 10s.; Barra, 77s. On Thursday there was no change in quotations, but there did not appear to be much disposition to do business. The market, however, would turn round quickly if any good feature cropped up, such as a very small charter, or peaceful tidings from the East. It is dangerous to be out of stock at low prices, and consumers should be on the alert. To-day there is a better market, and Wallaroo is 5s. higher, N.B. The price of Chill bars on the 10th inst. ought to have been quoted 12s. to 12s. 5s.

IRON.—The state of this market is still unsatisfactory, and prices tend downwards. The slight improvement which took place in bars and nail rods is gradually dying out, and there are no new orders of any magnitude to be obtained; the market is in a languishing condition, and before a decided or permanent increase in the demand can be looked for prices must be lowered, and brought down to such a figure as will compete successfully with foreign countries. The loss of orders at any time is very annoying, but it is particularly aggravating when there is such a severe depression, and it is most extraordinary that men should persist in holding out for wages that the trade cannot afford to pay, and only gaining partial employment, whereas by taking less they would certainly obtain more work. The necessity for cheaper production is absolute, and however reluctant men may be to work cheaper, yet they will have to do so. If the miners and colliers would yield a little more for their labour it would soon make a sensible difference in the prices and demand for manufactures, and low prices for manufactures would consequently create a greater demand for the raw material. The wages must be made up out of the extra quantity, and not by diminishing the hours of labour.

Our market is in that peculiar state just now that nothing short of unusually low rates will prevail; it is not only necessary that something should be done to stimulate consumption, but that means must be found and adopted to prevent Belgium participating and carrying off our orders. The English ironmasters are the largest capitalists of the two, and, therefore, ought to be able to sell cheaper and better than the Belgians. The price of pig-iron ought to be at least 10s. per ton lower than it is, and then there would be a fair chance of some activity in trade. The makers of Scotch and North of England pigs, seeing that stocks are increasing, and that sales are not adequate to the supply, had very much better give way a little at once than to wait in the vain hope of doing better. If sellers of iron were able to reduce their prices the advantage to the country would be immense. Cheap coal and cheap iron would set our manufacturing districts all

alive again, and we should soon be on the high road to prosperity, but if the price of iron is not lowered quickly a great part of the shipping business will be irretrievably lost. Scotch pigs are quoted 55s. 7 1/2d., and a fair business effected.

SHIPMENTS.	Tons	Value
Week ending Feb. 17, 1877	5,839	4,637
Week ending Feb. 19, 1876	—	—
Increase	1202	—
Total decrease for 1877	—	4,679
Imports of Middlesbrough pig-iron into Grangemouth:—		
Week ending Feb. 17, 1877	5,575	—
Week ending Feb. 19, 1876	5,130	—
Decrease	155	—
Total increase for 1877	10,227	—

LEAD.—The price still continues to decline, and ordinary English soft pig has been quoted down to 21s.

SPELTER.—Silesian has not altered. Hard in moderate request, at 18s.

TIN PLATES.—A slightly better enquiry, but no advance in rates. TIN.—The market has been drooping nearly all the week. On Monday Straits was 72s. 10s., and Australian 71s. On Tuesday Straits dropped to 72s., but Australian was unchanged. On Wednesday prices were quoted the same as the day before; but on the following day (Thursday) 71s. 10s. was accepted for Straits, and 70s. 10s. for Australian. To-day the market is looking up, and the price is about 10s. per ton higher.

THE IRON TRADE.—(Griffiths's Weekly Report).—Friday Evening.—The closing price of g.m.b. warrants on the Glasgow Exchange this afternoon is 55s. 6d. buyers, about 1s. per ton less than the price this week. We quote makers' No. 1 Iron Gartsherrie, 62s. 6d.; Coltness, 60s.; Calder, 61s. 6d.; Lang loan, 63s. 6d.; Summerlee, 61s. 6d.; Monkland, 57s. 6d.; Glasgow, 61s. 6d.; 60s. 6d.; Eglinton, 57s. 6d.; Ardrossan, 57s. 6d.; 56s. 6d.; Leith, 61s. 6d.; 57s. 6d.; f.o.b., 56s. The progress of the iron trade, since the opening of 1877, has been much less satisfactory than was generally expected at the close of last year. We have witnessed much quieter markets and less activity on this Exchange than was manifest in November and December, and we close the markets, to-day, in the same dormant condition. There was a very large business done in the raw material on the Middlesbrough and Birmingham Exchanges in November, when the ironmasters anticipated better trade. This circumstance no doubt explains the absence of large buying in all centres of the raw material by manufacturers.

The Glasgow market has exhibited weakness this week, with a loss of nearly 3s. per ton on Monday's prices, which then were 55s. 3d. It is a hopeful feature in the pig-iron trade to witness the steady consumption of the enormous output; and although the markets are weak, the fact of the supply being regularly taken by consumers is very encouraging; at the same time, as we have stated before, the great output in Middlesbrough and Glasgow seems to us to militate effectively against any advance in prices at either of these centres under present conditions of supply and demand. Increased shipping orders will alter the present unfavourable prospect; however, in the absence of these we cannot expect improvement, but may fairly anticipate the opposite. We believe that there will be an improvement in the trade in April and May, the Americans having settled their election for President; and possibly the debates in the House of Commons may have rendered the American question nearer to a peaceful solution. Stocks being low, and credit improving both at home and abroad, we have reason to look hopefully for the coming months of April and May. The tin-plate trade continues in a very unsatisfactory condition.

MESSRS. SANDFORD AND BIRD.—The metal markets generally are extremely quiet and inactive; manufactured iron shows no change, and pig-iron is somewhat easier.—COPPER.—The 1015 tons Wallaroo sold yesterday at from 77s. 2s. 6d. to 77s. 12s. 6d. per ton for cake and ingot, being a reduction since last month of about 6s. per ton. The markets close quiet at 70s. 10s. to 71s. for g.o.b. Chill bars, and 77s. 10s. for Wallaroo. English easier as per quotations.—TIN has a downward tendency, and the demand is limited. A fair quantity of Australian has changed hands at 71s. Straits is neglected. English ingots dull at 70s.—TIN PLATES still rule in buyers' favour, and show no sign of improvement.—LEAD is dull, but prices remain unchanged.—QUICKSILVER has been raised to 8s., reduced to 7s. 10s., and closes at 7s. 15s. per bottle.

THE MINING SHARE MARKET continues dull, and without any material alteration in nominal prices.

We hear of no particular change in the Metal Market, but at the Cornish Ticketing, on Thursday, the standard for copper ores declined 1s. 6s. per ton.

The shares chiefly dealt in have been Great Laxey, Glenroy, North Laxey, Van, East Van, Leadhills, Parys Mountain, Van Consols, West Chiverton, Wheel Grenville, Tankerville, and a few others.

The shares in TIN MINES continue flat. There is scarcely any dealing in the heavy stocks, and not much in others. Dolcoath are 35 to 37; the mine is said to be looking well at the bottom level. Carn Brea, 35 to 37; Cook's Kitchen, 3 to 3s; South Condorru, 5s to 6s; Treacroft, 19 to 20s; West Godolphin, 2s to 3s; Wheal Agar, 3s to 3s; Wheal Kitty (St. Agnes), 2s to 3s; Wheal Uny, 1s to 1s; Wheal Bassett, 7 to 9; West Bassett, 3s to 4s; South Frances, 15s to 20s; West Frances, 4s to 5s. Botallack meeting was held on Wednesday, and the accounts showed a profit of 2022l. on the three months' working, and a debit balance of 2345s. The tin sold was 110 tons; copper ore, 45 tons; credits, 5499l. The costs are charged to the end of December. Wheal Grenville, 1/2 to 1 (call paid); at the meeting a call of 10s. per share was made. The tin sold—7 tons 8 cwt.—realised 44s. 10s. per ton = 330l. 2s. 9d. South Crofty, 16 to 18; a call is expected here next week. New Consols, 1 to 1s.

IN COPPER MINES shares there has been little doing. West Tolgus, 59 to 61; at the meeting, in Cornwall, the accounts showed a profit of 718l. on two months' working, and a dividend of 1s. per share (512d.) was declared, and the rest added to the balance in hand, making 581l. The copper ores sold (642 tons) realised 3846l. The costs were charged to Jan. 5, and the ores sold for the next account, and not credited in this account, realised 3049l. 9s. 3d., which will leave about 200l. profit for the two months. The engine-shaft is down within 4 1/2 fms. of the 145. Prince of Wales shares have advanced to 4s. 6s.; the mine has materially improved in the 45 end west, which is now 3 ft. wide, worth 10s. per fathom, and going into whole ground from surface. This is the same level that yielded great riches further east. The agent considers the discovery as very important, and it is opening out ground that will work at a good profit. The 55 west is also yielding low quality ore, and in about a fortnight the 55 and 77 will be communicated, and open out ore ground.

Wheal Crebor, 2s to 3s; the lode in the 120 east is 6 ft. wide, and is still worth 25s. per fathom. The lode in the 108 east is 5 ft. wide, worth 20s. per fathom. In the winze sinking below the 48 the lode is worth 15s. per fathom. Devon Great Consols, 4 to 4s; Cocking's winze has been communicated with the 160; lode worth 30s. per fathom. The 130, east of Tregay's, is worth 12 tons of copper ore, or 50l. per fathom. The sale of ore on Thursday—820 tons—realised 3189l. Cathedral, 20s. to 30s. East Caradon, 1 to 1s; the sale of ore here realised 538l. Hingston Down, 10s. to 15s.; the sale of ore here brought 549l. 3s. 6d. Marke Valley, 1/2 to 1s; the sale here realised 1364l. Parys Mountain, 10s. to 12s. 6d.; no change here. Penstruth, 11s. to 13s. South Caradon, 11s. to 12s; the sale of ore here realised on Thursday 2659l. West Seton, 3s to 3s; Bedford United, 12s. 6d. to 17s. 6d. Holmbush sold at the tickling 75 tons of copper ore—55 tons at 3s. per ton and 20 tons at 2s. 9s.; total, 57s. 5s.

IN LEAD MINES shares the chief demand has been for Van, Great Laxey, Glenroy, North Laxey, and a few others. Roman Gravel is 13s to 14s; the 106, north of shaft, is yielding good stones of lead ore; the 106 shaft is worth 3 tons of lead per fathom. Tankerville, 8s to 8s; the 180 east continues to open out well, lode worth 75s. per fathom; 180 west, 65s. per fathom, and looking well for further improvement. The three stopes in back of 180 end, west of shaft cross-cut, are worth together 7 1/2 tons of lead ore per fathom. West Tankerville, 1s to 1s; the 63 south is improving. Great Laxey, 21 to 21s. Glenroy have been in good request, at 1s to 2s; the 40 stopes are turning out good blende, and the 50 rise in a rich lode mixed with blende throughout. The adit end north is in a very promising lode, yielding good stones of ore. There are several good points to come off, and the agent is very sanguine as to the results. North Laxey, 16s. to 18s.; no particular change here, except that the winze from the 121 is through the hard bar of ground, and lode very much improved. Van, 3s to 3s. East Van, 7 to 7s.

Derwent, 3 to 3s; these mines are improving, and the points in operation are yielding in the aggregate 13 tons of lead ore per fm., and the reserves of ore ground are being added to monthly. Leadhills, 6 to 6s; Combarmin, 12s. 6d. to 15s.; Aberdunant, 1/2 to 1/2; Asheton, 1s to 1s; Bodidris, 1s to 1s; Glyn, 2s to 2s; Great West Van, 1/2 to 1/2; Ladywell, 1 to 1s; Pennant, 5s to 6s; Pennerley, 1/2 to 1/2; Llanrwst, 1s to 2s; Gorsedd, 1/2 to 5s; Rookhope Lead, 18s. to 20s.; Van Consols have advanced to 2s to 2s; West Chiverton, 18s to 19s; West Craven Moor, 12s to 13s; Grogwinion to 5s, cum div.; Red Rock, 2s to 2s; South Cwmystwith, 3s to 4s; St. Harmon, 3s to 3s;

Wye Valley, 5s to 6s; West Wye Valley, 3s to 4s; Clementina, 30 to 40 per 128th; D'Eresby Mountain, 20 to 25 per 512th.

Among FOREIGN MINES Argentine are quoted 5s to 5s; Blue Tent, 3 to 3s; Condes, 4s to 5s; Birdseye, 1/2 to 1/2; Cedar Creek, 1/2 to 1/2; Chontales, 7s. to 9s.; Don Pedro del Rey, 1/2 to 1/2; Eberhardt, 1/2 to 1/2; Aurora, 8s to 9s; Emma, 1/2 to 1/2; Exchequer, 1s to 1s; Flagstaff, 3s to 3s; Frontina and Bolivia, 1s to 1s; I.X.L., 1/2 to 1; New Zealand Kapanga, 2s to 3s; Last Chance, 1/2 to 1/2; New Quebrada, 3s to 3s; Pestarena, 3s. 6d. to 4s. 6d.; Port Phillip, 8s. to 10s.; Richmond, 6s to 6s; St. John del Rey, 270 to 290; South Aurora, 5s. to 8s.; Sweetland Creek, 5s. to 7s.

The market for Mine Shares on the Stock Exchange during the week has continued without animation, and quotations generally almost nominal. Few transactions have been recorded, business being upon a most limited scale. The feature of the week has been the sharp decline, and equally rapid recovery, in St. John del Rey stock.

It is believed that the additional funds required for developing the property of the Aruba Island Gold Mining Company will now be obtained. It is very generally known that financially the concern is in a very unsatisfactory condition, having a debenture debt of nearly 10,000l., and other debts amounting to about 2500l., with no means of satisfying them. The directors being powerless to provide a remedy, one of the largest debenture-holders has taken action, and it is understood that on his behalf Mr. P. M. Taylor, of Threadneedle-street, has brought about an arrangement by which it is proposed to form a new company to lease the concession (from the old company), with a nominal capital of 50,000l., the debenture-holders undertaking to accept shares in the new company in payment of their debt. The new company is to get its capital back with interest, and then the old and new companies are to share profits with a capital of 100,000l. The management of the concern is to be placed in the hands of Messrs. John Taylor and Sons, of Queen-street-place, so that there is the best possible guarantee that the enterprise will be honestly and energetically carried on. As the original company started with a capital of 500,000l., and as the property is undoubtedly a good one, there is considered to be every chance of a company with one-fifth the capital—or 100,000l.—making the undertaking a success.

New Zealand Kapanga, 3 to 3s; a telegram to hand during the week announces that the sinking of the sump winze below the No. 5 level, and the driving of the level towards the C. romandel shute of gold, is steadily progressing. The opening of the mine is, therefore, going on very satisfactorily, and the prospects continue good. St. John del Rey, 280 to 310; the telegram from Rio, on Tuesday, states the produce for January to have been 33,500 oits. of the value of 12,980l., the ley of the ore being 6.1 oits per ton. The produce continues small, owing to the large temporary admixture of killas. The heavy rains have caused landslips with considerable damage, and the duty of the stamps is short from breakage of water-course. These casualties are excessively annoying, but are not regarded as likely to have any permanently bad effect upon the returns and profits. The sudden drop in the price of the shares at the beginning of the week, entirely through market operations, having called forth a justifiable criticism from the Times a complete answer has been given by Mr. John Hockin, the managing director, who explains that the company has now existed 46 years, and during that period has returned to its fortunate shareholders the capital six times over. It has in former times met with accidents, such as all mining concerns are liable to, and in 1867 a disastrous fire occurred which destroyed the mine, and it had to be opened out from the surface. This was accomplished after seven years' patient labour. During the whole of that period the shareholders had the fullest confidence in the management, and supported the directors throughout, and the result was the successful recovery of the mine at the end of 1873. Since that date the shareholders have received in dividends a sum equal to the entire capital of the company—253,000l., and a reserve fund has been formed, which now amounts to about 40,000l. One rule with the directors is to communicate all information received from the mines fully and unreservedly to the shareholders, and they never withhold for a moment information, whether favourable or adverse.

Argentine, 5s to 5s; a detailed report has been received, and a subsequent telegram reports sinking in the bottom of the mine in a lode the average yield of which is 2 ozs. 16 dwts., and the width of which is upwards of 26 ft., and is now being prosecuted. All other parts of the mine are looking well. The calciner has arrived. Mr. Oxland, the son of the inventor, is now due to arrive at the mines, and his report is expected at an early date. Condes, 4s to 5s; the official advices announce a discovery in the bottom worth 1000 per fathom, which is confirmed by a private telegram. A further shipment of ore is expected by the Pacific Mail, due next week. New Quebrada, 3s to 4s; the ship Semper Fidelis, with the second cargo of ore from this company's mines, has arrived, and been discharged at Swansea.

Richmond, 6s to 6s; the usual weekly telegram gives the week's run at \$55,000. The refinery has this week produced doré bars to the value of \$32,000. The manager's report states that operations in the mine were resumed on Monday morning. The 800 ft. drift has been driven a further 50 ft. No. 1 winze is down 40 ft.—the bottom in limestone, at which point a drift was commenced to intersect the ore which crossed the winze above. No. 2 winze is also down 40 ft., the ore met with in it being of low grade. The stopes are about the same as last reported. At the 600 ft. level the drift started from the footwall cut a vein of good ore, which looks promising. The 400 level is looking well, widening as the work goes upwards, and looking promising. The furnaces are in full blast, and working satisfactorily. The accounts of the proceedings in the late injunction suit are as yet incomplete, the local papers to hand only reporting the opening of the case.

Exchequer, 1s to 1s; the manager writes that the lode is larger as they go deeper, and its quality, he believes, will progressively improve. The hoisting-works just completed are capable of going down 1000 or 1200 ft. The personal supervision of the manager has been hitherto needed in the completion of many important works at the mine, as well as the stamps-mill, the saw-mill (with its concomitant log-cutting and hauling teams and teamsters), and there are 80 men employed. This multiplication of work will not occur again. It appears Mr. O'Hara is confident he will extract 85 per cent. of what is in the ore, but the manager thinks 90 per cent., and states that the only limit to the quantity of ore obtainable from the mine when the shaft shall have been sunk to 1000 ft. will be that fixed by the number of men employed. The new foreman, some time underground agent in the Virginia Consolidated Mine, says he wishes no money if he does not supply the 18 stamps to their full capacity every day in the year, provided he has men enough. I.X.L., 1/2 to 1/2; the indications in the cross-cut at the 200 ft. level justify the manager in expecting they are getting into a paying body of ore at no distant day. The lode has well-defined walls, and is 7 ft. wide. The Buckeye adit, which takes the shaft water 35 ft. from the hoisting-floor, is 111 ft. north from shaft, and turned out five carloads of good ore. Eberhardt and Aurora, 8s to 8s; there has been received a further shipment of bar silver, valued (at present price) at about 5000l. Chicago, 4s to 5s; the net profit for January was \$5000.

The market for Hydraulic or Gold Mining shares has been quiet, and prices are unchanged. It is stated that there are in California alone over 500,000 acres of gravel deposit that can only be worked by hydraulic mining, and of this not more than 1-20th has been mined; this has produced over \$900,000,000. The miners throughout the State are at work on every piece of auriferous gravel to which they can bring water. The latest news is up to Feb. 1, at which date most of the claims represented on this market were at work. The prospects for good returns are encouraging. Most of the companies have completed their dead work, and have everything in readiness for profitable washing.

The shares in Lead Mines are without much quotable variation. Van, 3s to 3s; the only change reported is an improvement in the 90 west. Other parts unchanged, and all work both underground and at surface proceeding with the accustomed regularity. Van Consols, 2s to 2s; the completion of the drawing shaft, the fine at

appearance of the lode, which is reported to be worth 80¢ per fathom for lead, and the important fact that the 40 east of main shaft is also entering into good ore ground, has attracted increased attention to the mine. Glyn, 2½ to 2¾; All work progressing with regularity, and arrangements are being made for dressing the lead for the market. Grosvonts, 5 to 5½; the half-yearly dividend warrants (at the rate of 20 per cent. per annum) were sent out on Wednesday. The rate of 20 per cent. per annum will be made next week; 100 tons of allotment of the new shares will be made next week. The manager reports that No. 1 lode has improved since the general meeting. Wye Valley, 5½ to 6½; in driving the 22 east the lode has again improved in appearance. The new shaft will be pushed down as soon as the rain moderates. West Wye Valley, 3½ to 4; the lode at the 40 is improving, and Brooke's shaft is still going down in favourable ground. Red Rock, 2½ to 2¾; since the works were started the mine has been put into a thoroughly efficient state of repair, and the working can now go on without hindrance. Good progress is being made in opening out the ground, and prospects are considered exceptionally good. St. Harmon, 3½ to 3¾; the mine continues to improve both West and East at the 35, and the lode is now being proved by cross-cuts at the bottom level. The new dressing machinery is being pushed forward. South Cwmystwith, 3½ to 4; good ore has been cut in the intermediate cross cut, and a great deal of good ore is issuing from the end, a most encouraging feature. All other points looking well, and yielding well for lead.

Pennerley, 3 to 3½; the lode in the 130 east is worth 1½ ton per fathom. The lode in the winze sinking below the 120 east is worth 3 tons per fathom; this winze is in advance of the 130 end, and the latest advices state that a stream of water has just been cut in the 130, which had drained the winze, and that from appearances the end was just about entering a strong and profitable lode. Pateley Bridge, 2½ to 3; the 30, both east and west on Rake vein, is opening out in a very encouraging manner, and the agent states his belief that it is just bordering on a general deposit of lead. The cross-cut towards Lumb vein, in the 20 west, is letting out more water; other places unchanged, and producing about the usual quantity of lead ore. West Pateley Bridge, 1 to 1½; the agent writes that the vein in the rise in back of the 56 has again improved; other parts of the mine unchanged, and dressing going on steadily. At the special meeting on Wednesday it was resolved to subdivide the capital into 17 shares.

Penrithal, 11s. to 13s.; the levels are being pushed forward from the bottom of the shaft towards the copper ground gone down under the 58 and west. Cathedral, 20s. to 30s.; the mine is steadily developing into a good course of copper ore.

Subjoined are the closing quotations:—

Ashton, 1½ to 1¾; Carn Brea, 36 to 38; Devon Great Consols, 3½ to 4½; Great Laxey, 20 to 21; Great West Van, ¼ to ½; Hingston Down, ¼ to ½; Leadhills, 6½ to 6¾; Marke Valley, ¾ to 1½; Parys Mountain, ¾ to ¾; Pateley Bridge, 2 to 3; Pennerley, ¾ to ¾; Penrithal, ¾ to ¾; Roman Gravel, 1½ to 1¾; Tankerville, ¾ to ¾; Tincroft, 10 to 11; Van, 35 to 37; West Consols, 2½ to 2¾; West Pateley Bridge, 1 to 1½; West Tankerville, 1½ to 1¾; Wharfedale, 2½ to 3; Wheel Grenville, ¾ to 1½ (call paid); Almaden, 1½ to 1¾; Argente, 5½ to 5¾; Birdseye Creek, ¾ to ¾; Blue Lead, 3 to 3½; Cape Copper, 4½ to 4¾; Cedar Creek, ¾ to ¾; Chontales, 5 to 5½; Colorado Terrible Lode, 1½ to 2½; Concha de Chili, 4½ to 5½; Don Pedro, ¾ to ¾; Eberhardt and Aurora, 5½ to 6; Emma, ¾ to ¾; Exchequer, 1½ to 1¾; L. L. L., ¾ to ¾; Kapanga, 3 to 3½; Last Chance, ¾ to ¾; Malpas, ¾ to ¾; Malpas, ¾ to ¾; New Pacific, ¾ to ¾; New Quebec, 3½ to 4; Pateley Bridge, 1½ to 1¾; Pumas Eureka, 2 to 2½; Rica, ¾ to ¾; Richmond Consolidated, 6½ to 6¾; St. John del Rey, 25 to 25½; San Pedro, ¾ to 1; Sierra Buttes, 1½ to 1¾; South Aurora, ¾ to ¾; Teconia, ¾ to ¾; United Mexican, 2½ to 2¾; Oregon (pref.), 4 to 4½.

COLLIERIES.—During the past week but few transactions have taken place in colliery shares, this market, like all those for stocks and shares, whatever the description, having been influenced by the stagnation in general trade. Quotations, however, remain about the same, the exception, which proves the rule, being the price of Chapel House shares, which have received a stimulus from the cutting of the celebrated Park seam last week, and have risen to 3½; this seam was cut in the 16 ft. pit, at a depth of 388 yards from surface. It is 5 ft. 10 in. thick, all solid coal, which is said to be of magnificent quality, and the roof and floor of the seam being good, it is believed the coal can be worked economically and cheaply. It will take a short time to get the opening out of the seam under weigh, but some attention to the present output of the colliery will soon be made from this source. The sinking of the 15 ft. pit, now down 179 yards, will be proceeded with at once, and should be down to the Park seam by the beginning of October, after which the output can be at once increased to 1000 tons per day. Thury's Gaspar shares, which the directors' report and accounts have been issued, and from them it would appear that during the six months ending Sept. 31 there have been raised and sold over 101,332 tons of coal, realising a profit of 2503. 1s. 2d., as against a loss of 22. 5s. 1d. for the previous half-year, and this in the face of a reduced price obtained for the coal. It is stated that the profit above mentioned has been obtained during only three months out of the six embraced by the accounts. The shareholders may, therefore, be congratulated on a greatly improved prospect as regards the future of the colliery, but it should be pointed out, however, that no allowance has been made for depreciation, &c., of plant. New Sharlston has been little dealt in, but remains about the same as last week—4 to 4½; the report shows a profit for the year of 7518. 10s. 6d., the whole of which sum has been appropriated to depreciation of plant account. It is suggested that each ordinary shareholder should accept one new preference share for 20 ordinary shares. This course, if adopted, would reduce the nominal capital of the company from 350,000. to 344,000. Cakemore has been offered and close at 2½; Bilson and Crump Meadow close at 4½; 7; Carliff and Swanssea at 2½; and Newport Abercrombie at 4 to 4½; Alltani, 4 to 4½; the operations are reported to be proceeding satisfactorily. Lay Hall, 9½ to 10; the coal raised from the main seam is stated to find a good market. Canno and Huntington close at 1½ to 2½; Hamstead, 9 to 9½; John Bagnall (Limited), 3½ to 4; Mid-Cannock, 13 to 13½; Sandwell Park, 20 to 22½; Spon Lane, 4½ to 4¾; West Cannock, 5 to 7 1d.

At the Truro Ticketing, on Thursday, 2694 tons of copper ore were sold, realising 10,602. 6s. 0d. The particulars of the sale were:—Average standard, 106. 2s.; average produce, 6½; average price per ton, 3s. 19s. 0d.; quantity of fine copper, 169 tons 17 cwt. The following are the particulars:—

Date.	Tons.	Standard.	Produce.	Per ton.	Per unit.	Ore copper.
Jan. 18, 1877	3998	104 0 0	6½	£4 1 6	128	5½d. £63 7 0
Feb. 1, 1877	1224	99 19 0	7½	5 2 6	130	0 65 0 8
" 22, 1877	2094	106 2 0	6½	3 19 0	12 6	62 10 6

Compared with the last sale, the decline has been in the standard 1½, and in the price per ton of ore about 1s. 8d.

DERWENT.—It is most satisfactory to find this valuable and important property turning out equal to the high anticipations entertained of it. The four levels being driven at Westgarth's and J-frier's shafts are opening stopping lead ore ground to the extent of 90 fms. per month, and the quantity taken away is only 35 fms. per month, so that about 55 fms. of ore ground are being added monthly to the reserves. Valuable discoveries are expected soon in the various levels and cross-cuts, particularly when the Sun vein is cut in the little limestone, in which the other lodes in the mine have been very rich, but the Sun vein has never yet been seen in that sill, though it has been very productive in the other sills.

THE DISCOVERY OF SILVER AT WHEAL NEWTON.—We are informed by the general manager that he has just brought up with him a magnificent rock of ore weighing nearly 4 cwt., and assaying over 1000 ozs. of silver to the ton, which he will be happy to show to any person on application at the offices of the company, Palmerston Buildings, Bishopsgate, where also may be seen a fine collection of samples from Holmbush.

NORTH BUSY UNITED.—This mine continues to open up remarkably rich, and is one of the best young tin and copper mines in Cornwall. The 35 end is being driven in a lode worth 40¢ per fathom; cost of driving 4½. 10s. per fathom, and lode standing whole to surface; the 12 end driving west is improved, and opening up a long run of profitable ground.

GORSIEDD AND MERLLYN.—The lode is improving. At No. 2 ramp the ore is quite solid for over 1 ft. wide. There can be no doubt that a great success is achieved.

LLANIDLOES (Lead).—The proprietors have responded well to the appeal for additional capital, and a large portion of the debentures have already been applied for. This is, no doubt, to a certain extent owing to the fact that the directors and manager have further evinced their faith in the concern by subscribing liberally, and there appears to be no doubt that if all combine to give the mine a vigorous working it will handsomely repay their outlay. All persons who have lately seen the mine are unanimous in saying that its prospects fully justify a vigorous development, and that if a liberal working capital be provided, and judiciously expended, it will equal in productiveness the best mines in the district. Life-

accounts state that the lode at the 72 continues steadily to improve, and there are the best possible prospects for the deeper levels.

SANTA BARBARA (Brazil).—By the last advices from Pari, dated Jan. 14, we have news from the mine up to the end of December, which shows that the estimated profit for the year was 7766. This result was obtained from 49 heads of stamps. A new 15 heads of stamps was to be at work by the end of January, making a total of 64 heads, which will enable them to stamp more than a quarter more stone than they have been doing in 1876, so that the returns and profit for 1877 will be much larger, and the dividends increased.

THE ALMADA AND TIRITO CONSOLIDATED SILVER MINING COMPANY.—We refer our readers to the interesting reports from the mines, published in to-day's Journal, which come up to Jan. 11. The Tirito appears to be improving steadily at the 42 and the 47 below adit, at which latter point the lode crosses the Tirito engine-shaft. The produce from the lower levels of the Tirito is an argentiferous copper ore, which can be treated on the spot by the patio process. Since Jan. 11 Mr. Breach sent a telegram of the date, probably, of Jan. 20, and arrived in London on Feb. 5, as follows:—"Treating black ores successfully. Working Mina Grande." This is of great importance as showing that Mr. Breach had discovered a method of profitably calcining and reducing the black ores on the spot with quicksilver by the patio process. Mr. Breach's letters had previously reported experiments in that direction, which gave promise of a successful result. As before this, in December Mr. Breach had made a profit of 6000. in the month, the prospects of the future must be looked upon as most encouraging.

THE FLAGSTAFF.—At a meeting of the shareholders yesterday, which is fully reported in another column, some alterations were made in the Articles of Association. The mine is now making returns, and Prof. Vincent, who visited the property in April last, speaks in high terms of the quality and quantity of the ore. Great credit is due to the energy which the present board have displayed in preserving the property for the shareholders.

ARUBA GOLD MINING COMPANY.—At a meeting of the shareholders, held on Thursday, which is fully reported in another column, it was decided to re-organise the company. There exists without doubt considerable mineral wealth in the property, and there appears to be no reason why, under the projected energetic management, good returns should not be secured for the shareholders. The mining management is about to be placed in the hands of Messrs. John Taylor and Sons, of Queen-street-place.

The directors of the Sun Auto-Pneumatic Lighting and Heating Company have declared a dividend of 7½ per cent. for the past year.

The Anglo-Californian Bank has declared an interim dividend of 10s. per share for the half-year ended Dec. 31, being at the rate of 10 per cent. per annum. The report of the United Lumber and Vorwolve Rock Asphalts Company for the year 1876 shows a profit of 5225. From this 1200. is placed to the reserve fund, and the proposed dividend of 4s. per share absorbs 3900., leaving 56. to be carried forward.

NOTICE OF REMOVAL.

MESSRS. F. W. MANSELL AND CO. (SWORN STOCK AND SHARE BROKERS), have REMOVED to 43 AND 43A, PALMERSTON BUILDINGS, OLD BROAD STREET, LONDON, E.C.

DESIRABLE INVESTMENT FOR CAPITAL. WANTED, A FEW GENTLEMEN, TO JOIN IN THE PURCHASE AND WORKING OF A PIECE OF MINING GROUND IN THE RICHEST KNOWN DISTRICT IN ENGLAND. 260,000 worth of mineral has been sold from surface, as deep as 40 fathoms. A steam engine of sufficient power is on the property, and pitwork all fixed ready to work. £1500 will be sufficient to purchase the sett, with its machinery, and sink the mine 20 fms. deeper, and open up a rich copper mine. It is proposed to divide it into 50 shares, at £30 each. Early application is necessary to secure it. Apply for shares to Mr. CHAS. BAWDEN, Poldice House, St. Day, Scornier, Cornwall.

WANTED, A WELSH SILVER-LEAD MINE.—Must be partly developed, and in such condition that ore can be immediately extracted. With machinery preferred. Send full particulars, with lowest price, to "F. P. P." Deacon's, Leadenhall-street, London, E.C.

WANTED TO PURCHASE IMMEDIATELY, ZINC ORE, BLENDE, and CALAMITE MINES. Send full particulars addressed to "Purchaser," MINING JOURNAL Office, 26, Fleet-street, London, E.C.

WANTED, A SECOND-HAND GOOD 40 or 45 in. cylinder PUMPING ENGINE, with one or two BOILERS. State price, and where they are to be seen. Address, "R. M.," care of Mr. Thos. B. Provis, Camborne.

TO MINING COMPANIES.

A YOUNG MAN, at present holding the position of CLERK and DIALLER, will be shortly disengaged, and WANTS A SITUATION OF TRUST IN A LARGE MINE or MINING OFFICE. Has been bred to Mining, and understands the practical part of the working of mines also. Highest references. Address, "R. T.," MINING JOURNAL Office, 26, Fleet-street, London, E.C.

A GENTLEMAN wishes to MEET with ONE or TWO OTHERS TO JOIN HIM IN WORKING A RICH COPPER MINE IN THE CARNARVON DISTRICT. Everything, including necessary machinery, is ready to start working for the market. Capital required, from £200 to £3000. Address, "Peacecock Ore," Post Office, Bangor.

A PRACTICAL MINE AGENT is DESIROUS of an ENGAGEMENT at HOME or ABROAD. Over 10 years at (Mr. Mason's) SAO DOMINGOS MINES, PORTUGAL. Fully conversant with the Spanish and Portuguese languages, and management of men. Apply to Mr. H. COLLISON, 5, Bond-court, Walbrook, E.C.

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THE ADVERTISER, about to erect Metallurgical Works in this country, requires the services of an EXPERIENCED PRACTICAL MANAGER as PARTNER, or otherwise. Partner preferred. State experience, salary (or interest), &c., to "W.," MINING JOURNAL Office, 26, Fleet-street, London.

BEAM ENGINE, 15 in. cylinder, 3 ft. stroke, two malleable iron shafts, 9 ft. by 6 in., two fly wheels, FOR SALE. Particulars on application to Mr. Geo. V. TURNBULL, Leith, N.B.

FOR SALE.—16 horse power DOUBLE CYLINDER SEMI-PORTABLE ENGINE, by ROBESY and Co., nearly new, in splendid condition. Apply, WARSON and HILL, Engineers, Nottingham.

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20 Alltani, £55.	20 East Caradon, 20s.	200 Pestarena, 3s. 9d.
50 Bodidris.	40 Frounting, £1 12s.	25 Pandora.
20 Birdseye Creek, 17s. 6d.	25 Flagstaff, £3 13s. 9d.	60 Port Phillip, 11s. 3d.
25 Cedar Creek, 15s. 9d.	30 Gleucroft, £1 11s. 3d.	50 Parys Mount, 11s. 6d.
25 Combmartin, 9s. 6d.	60 Great W. Van, 7s. 9d.	80 Penrithal, 12s.
40 Chontales, 8s. 3d.	40 Gold Run, 11s. 9d.	15 Richmond, 6s. 6d.
20 Chapel House, £3 1s. 3	25 L. X. L., 18s.	25 St. Harmon, £2 18s. 9d.
15 Cakemore.	10 Leadhills, £8½.	60 South Aurora, 8s.
15 Eberhardt, £8 18s. 3d.	20 Marke Valley, 10s. 6d.	15 Van Consols, £2 8s. 9d.
30 Exchequer, £1 18s. 9d.	40 Nth. Laxey, 17s. 6d.	20 W. Tankerville, £1½.
25 East Chiverton.	10 Penant, £6.	50 Great West Work.

Shares Bought and Sold at net prices. Telegrams promptly attended to.

FOR SPECIAL SALE:—

10 Pateley Bridge, £2 16	20 Argentine, £5½.	50 Hingston, 18s.
10 Wye Valley, £5 7s. 6d.	20 Alamillos, £2 7s.	40 Rockhope, 15s. 6d.
20 Condes de Chili, £4½.	1 Lieburne, £206.	10 Glyn, £2 3s.
15 Chicago, £4½.	2 Minera, £18½.	10 W. Craven Moor, £12½

SHARES WANTED, or PART:—

50 Last Chance, 8s. 6d.	25 Rockhope, 15s.	20 Derwent, £1½.
50 Sweetland, 6s.	40 Cedar Creek, 14s.	30 Pennerley, 13s. 3d.

FOR SALE, THE WHOLE OR PART:—

100 PARYS MOUNT £20 11 0	100 VAN CONSOLS £2 5 0
120 ABERDAUNANT 0 12 0	20 MINERA 20 0 0
25 GLYN 3 5 0	25 WEST FODOLPHIN 2 10 0
30 GROSVONT 5 0 0	25 WYE VALLEY 5 0 0

WANTED TO PURCHASE.—1 to 10 LIEBURNIE MINES; 50 to 100 GORSIEDD AND MERLLYN; 50 to 100 FLAGSTAFF. Address, H. WILKINS, 3, Heybourn Villas, Tottenham, N.E.

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Mr. E. JACKSON,

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Notices to Correspondents.

* * * When inconvenience having arisen in consequence of several of the Numbers during the past year being out of print, we recommend that the Journal should be filed on receipt; it then forms an accumulating useful work of reference.

LAST CHANCE MINING COMPANY.—Will you allow me, through the medium of the Journal, to ask my brother shareholders to assist the directors in saving our property? They have several times appealed to us to aid them, but little help has been given. The winding-up order has been applied for; our secretary has been working months without pay; and we are turned out of the mine without payment of rent. A last appeal is now made—if we cannot afford to give cash, we may still assist by giving shares, which it is in the power of all to contribute. I have hitherto refused the former, but I willingly surrender half my shares because I feel sure, if the directors would follow in the footsteps of the Flagstaff Company (and by giving them something in hand as a guarantee we might urge them to do so), I shall expect instead of a sacrifice to gain more by the increased value of my remaining shares. On the other hand, if the company collapses, what are the shares worth? As a last chance, let me beg my fellow-shareholders to reflect upon the result of refusing and in following the example of—A BROTHER SHAREHOLDER.

LECTURES ON MINING—"J. B." (Isle of Man).—The first volume only of Prof. Callon's Lectures on Mining, delivered at the Parisian School of Mines, has only yet been published. The price is 25s., and it may be obtained of Messrs. Dulau and Co., Soho-square.

COPPER QUOTATIONS—"C. A. S." (Birmingham).—The price of Chili bar on Feb. 10 should have been quoted 7 1/2 to 7 1/2 1/2.

Received—"J. W. M." (San Francisco).—Consolidated Virginia and the California—The late Managing Director of the Newfoundland Mining Company—"N. E. R."—"Observer" (Hombush): We will endeavour to ascertain some particulars—"L. A. A."—"D. C."—"M. B. G." (Outlines of Geology): Next week—"W. A."—"Inventor" (Manchester): The letter on the Patent Laws is far too long for publication in the Journal; it should be printed as a pamphlet—"E. D."—"Shareholder" (Glasgow): Not a shareholder—"H. Day" (Unity Wood): Thanks.

THE SUPPLEMENTARY SHEET.—We have received occasional complaints, and of late a good many, that the Journal is delivered by country booksellers without the Supplement. Subscribers would oblige us by demanding that the paper should be handed to them complete, as every Journal is accompanied by the Supplement when it leaves our office, and the fault of omission must rest with the country bookseller or their London agent.

IMPORTANT NOTICE—REDUCTION OF POSTAGE ON THE "MINING JOURNAL."—In consequence of the new POSTAL CONVENTION, which came into operation on July 1, the postage of the Mining Journal to many countries will be reduced to one fourth. Henceforth the subscription will be 12. 10s. 4d. per annum (39 frs.), postage included, for the following countries. The amount will, if desired, be collected at the subscriber's residence at the end of each year. The subscription continues until countermanded:—Austria, France, Belgium, Denmark (including Iceland and the Faroe Islands), Egypt, Germany, Gibraltar, Greece, Heligoland, Italy, Luxemburg, Netherlands, Norway, Portugal (including Madeira and the Azores), Roumania, Russia, Serbia, Sweden, Switzerland, United States, Malta, Turkey, Morocco, Tunis, and the Canary Islands. Spain 12. 10s. (50 frs.)

THE MINING JOURNAL.

Railway and Commercial Gazette.

LONDON, FEBRUARY 24, 1877.

OUR IRON ORES.

It is somewhat singular, after so much has been written and said with respect to our stores of fuel, and the probable period when they will be exhausted, that little or no notice has been taken of the extent of our ironstone fields, how long those now being worked are likely to last, even with the present strain upon them, or where new deposits may be expected to be found. Yet, next to coal, it is the most important mineral we have, to say the least, whilst of late years the consumption of it has increased in a greater ratio even than coal itself. The varieties of ironstone are more numerous than coal, whilst the value varies a great deal more, hence the importance of a knowledge of the various descriptions and the places where they are to be found. With regard to coal, we are in possession of all the facts relating to where it is to be met with in different counties, and the quantity that will be raised down to a certain depth, but no such information can be obtained in respect to our iron ores, although there is no comparison between the value of their products and coal itself. From them we have the most ponderous machinery, as well as the most minute springs and valuable particles of steel, yet no one that we are aware of has ever suggested that we should have duly scheduled, as near as possible by properly qualified Government officials, the extent of our ironstone fields, their probable duration, and the quality of the deposits. With such information many persons would, doubtless, be inclined to seek for the most valuable ores. We know that the best deposits are those found in the North Lancashire and Cumberland districts, where the hematites are found as veins in the Lower Silurian, but are both larger and purer in the Mountain limestone; the latter being in three districts—Furness, Whitehaven, and Millon. In ages long ago, no doubt, by volcanic force mighty gorges were formed, where fissures of limestone were the result, and these fissures were afterwards filled with iron oxides, barytes, and the oxide of manganese, and it is from these that we now obtain the richest and best of our iron ores. Then there is that rather extraordinary deposit in Cornwall—the great Perran Iron lode, averaging about 50 ft. in width for a course of several miles, containing large quantities of spathose iron. The upper part of the lode consists chiefly of brown hematite, due to the decomposition of the spathose ore met with before the sea level is reached. The great bunches of ore in the lode appear to occur where it is crossed by the north and south lead lodes of the district. At Frampton Cottrell, a few miles from Bristol, some excellent brown hematite is being worked, but of which we hear very little. In Somersetshire spathose ore is found in the Silurian and Devonian systems, as well as in the carboniferous limestone at Ashton, near Bristol. We have noticed the chief places where the finest qualities of hematite ore are to be found as at present known, but feeling assured there are many other districts where they will be met with. It is information with regard to the latter point, as well with respect to the extent generally of the known fields of the same qualities, that we have been induced to notice the matter.

It is true that our hematites form only a very small portion of the ore raised in the kingdom, yet their consumption is rapidly increasing, seeing that from them our Bessemer steel is principally made. We are aware that the ores mostly used in making iron are the oxides and the carbonates, which are found in a variety of situations, the latter frequently in connection with the collieries. In Northamptonshire, or at least in some parts of it, there are two beds of the hydrated oxide containing from 30 to 40 per cent. of metal. The upper, 12 feet thick, is separated by 10 or more feet of an oblique substance from the lower one, which is from 15 to 20 feet in thickness. Then we have the vast deposits in Cleveland, as well as in Lincolnshire, of the extent of which, the latter in particular, we have no really reliable knowledge, but it is quite probable that the measures run through Lincolnshire into Northamptonshire, and in all probability are joined together in the small county of Rutland. The lias and oolite formations extend from the north-east coast of Yorkshire to the south coast of Dorsetshire, and there is every reason to believe that ironstone will be found running continuously throughout the entire distance. But of this our knowledge is very limited, so that were the necessary data given officially landowners would not let such fields lie fallow, but would be only too glad to utilise them.

The value of ore, as we before stated, varies most materially, so that in some instances a landowner with a valuable quality of ore in it would at once take advantage of it, and so bring into the market the quality of stones for which there is the greatest demand. From the latest returns we find that the value of the hematites of Cumberland and North Lancashire is exactly 15s. per ton, whilst Cleveland is only rated 4s. per ton. In Cornwall the value is put down at 14s. per ton, and in Northamptonshire at 3s. 4d. per ton. These are wide apparent discrepancies that may be correct or otherwise, but it shows that there are districts where owners must be making very large profits, whatever others may be doing.

As to the extent of the districts where ironstone is now being worked there is no actual data to go upon, and this appears to us to be of almost as much value as the statistics furnished with respect to the areas of our various coal fields. Looking at the last

10 years we find that there has been a vast increase in this production, and whilst some districts show a falling off in the production others show a vast increase. This will be seen from the following figures of the tonnage raised in the period named—

	1866—tons.	1875—tons.
Cornwall	18,884	11,404
Devonshire	49,871	10,694
Somersetshire	35,323	45,185
Gloucestershire	162,129	111,825
Wiltshire	75,645	87,152
Oxfordshire	1,652	34,568
Northamptonshire	476,981	1,085,599
Lincolnshire	175,720	573,368
Shropshire	255,907	240,568
Warwickshire	18,700	97,456
Derbyshire	329,500	218,132
Nottinghamshire	—	11,751
Staffordshire	612,243	939,024
Staffordshire, South	599,009	715,451
Lancashire, &c.	635,727	535,584
Cumberland	2,809,081	1,147,068
Yorkshire, North	357,000	6,121,794
Yorkshire, West	105,090	353,582
Northumberland, &c.	56,682	60,515
North Wales	368,866	47,184
South Wales, &c.	1,887,000	2,452,235
Scotland	25,525	125,002
Ireland	—	—
Total	9,665,012	15,821,000

From the above figures it will be seen that there has been a decrease between the two periods from several districts, and the question is, as we before state, whether such is the result of the exhaustion of the fields, or otherwise? It is such information, given authoritatively, that we consider would be of great value, and we see no reason why it should not be obtained by the Government as in the case of coal.

COAL MINING IN BRITISH COLUMBIA.

Some time since we noticed the journey of a correspondent of the Journal, Mr. BUSHBY, formerly of the Darfield Main Colliery, near Barnsley, from Cape Breton, where he was the manager of a large colliery, to British Columbia, to fill a similar position, and it now appears that coal mining there is about to be carried out extensively. The new colliery is at what is known as Baynes Sound Settlement, a colony which had no existence nine months ago, but now gives every promise of becoming a very important one. Quadra is the name of the town, and it has all the necessary requirements for supplying not only the place itself, but the surrounding districts or settlements, as they are termed, and these include a hotel, of course, stores, blacksmiths' shops, saw-mills, engine-house, dwelling houses, &c. The colliery at the latest date was progressing rapidly, there being a large two-storied building for the use of the miners, good offices, with engineers' residence, &c. In sinking some coal was met with, whilst in driving a considerable tonnage has been placed on the pit bank. A new locomotive is on the ground, called the "Quadra," after the new town, and has commenced running. The engine will convey the coal from the colliery to a newly-erected wharf capable of accommodating half-a-dozen vessels. The line of rails is about 3 1/2 miles long, and passing along the banks of the Sohal discloses some exquisite scenery. Coal, it may be said, is a rather scarce article in British Columbia, for at Victoria the price to consumers is something like \$10 for the English ton; it may, therefore, be fairly assumed that the Baynes Sound Colliery will be a welcome addition to the mines already at work, and be not only a benefit to the public but a profitable undertaking for the shareholders. It may be said that coal is shipped from some pits to California, so that there is plenty of room for enterprise and capital in our extreme North American possessions.

In Vancouver's Island there are extensive beds of lignite and coal of the tertiary and cretaceous periods, which have long been worked, not only for supplying the steamers trading between Victoria and the Fraser river but for shipment to several ports. Some of the lignite is upwards of 9 feet in thickness. The tertiary coal fields, it may be said, extend a considerable way from California to the southern end of Vancouver's Island and British Columbia, whilst that of the palaeozoic age in Queen Charlotte's Island, off the northern coast of British Columbia, yields anthracite. The importance of the vast coal deposits in British territory on both sides of the Rocky Mountains has been commented upon by Dr. HECTOR, who lays great stress on their value, showing that these offer a certain inducement towards a route to China and the East by Canada, the Saskatchewan, and British Columbia. The coal worked in Vancouver's Island at present gives from 66-20 to 71-20 per cent. of carbon. It will be seen that there is a vast field as yet unopened for the capitalist and the miners, and it is evident that no more encouraging prospects can be found, so far as mining is concerned, than on the North Pacific Coast. We hope before long to be able to give more particulars of what is being done at the mines in that distant part of Her Majesty's dominions, and how far labour at the mines is profitable. It is more than probable, however, that there is now plenty of room for experienced miners, of which in England at the present time there is a plethora.

RAILWAY ECONOMY.

The leading home railway companies have profited rather materially in some cases during the last six months—that is, to be a little more precise, in the last half of 1876—from the fall in coal and iron. Thus on the London and North-Western Railway the coal and coke consumed by the locomotives and in the locomotive repairing shops cost 138,179. in the second half of 1876, as compared with 173,779. in the corresponding six months of 1875, showing a reduction under this head alone of 35,600. The increase in the net profit realised by the London and North-Western in the second half of 1876, as compared with the second half of 1875, was 24,806. so that if coal had remained at the price at which it stood a few months since there would have been no increase of profit at all. The maintenance and renewal of way—an item in which iron occupies a prominent place—cost the London and North-Western Railway Company 398,352. in the second half of 1876, as compared with 430,757. in the corresponding period of 1875, so that here, again, a considerable saving was realised. The experience of the Lancashire and Yorkshire Railway in the matter of coal and iron has been very similar to that acquired by its powerful neighbour, the London and North-Western. Thus coal and coke consumed in the "loco" department of the Lancashire and Yorkshire cost that company 56,636. in the second half of 1876, the corresponding outlay in the second half of 1875 having been 65,722. In the permanent way department of the Lancashire and Yorkshire the reduction realised in the cost of materials employed was still more considerable, the outlay under this head in the second half of 1876 having been only 84,211. as compared with 100,206. in the second half of 1875. In the case of the Great Northern, the cost of the coal and coke consumed in the "loco" department in the second half of 1876 was 60,822. against 70,605. in the second half of 1875. But the Great Northern, singular to relate, did not benefit much from the cheapness of iron in its way and works department, materials in this branch of the company's management having cost 68,728. in the second half of 1876, against 61,003. in the second half of 1875. The result of the direct gain which the London and North-Western and the Lancashire and Yorkshire Companies derived from the comparative cheapness of iron and coal was that the London and North-Western was enabled, in spite of the dulness of the times, to maintain its ordinary stock dividend for the second half of 1876 at the same rate as that at which the corresponding dividend stood for the second half of 1875. The Lancashire and Yorkshire was even enabled to slightly increase its ordinary stock dividend; the Great Northern, not having been equally successful in turning the reduced cost of iron to profitable account, saw, on the contrary, its ordinary stock dividend fall to 6 1/2 per cent. per annum.

The reduction in the price of iron and coal has not, however, been an unmixed advantage to the railway interest, as it has been the necessary concomitant of very considerable depression in the commerce and industry of the country. Had not the money market been reduced to a deplorable state, through the collapse of the credit

of numerous foreign countries, there would probably have been a better demand for iron, and this better demand would have, no doubt, brought higher prices in its train. Well, it would have been better for our great railway companies to have paid a little higher price for the rails which they had to purchase if at the same time they had not had to suffer from the general collapse of credit, which has, of course, involved loss of traffic.

COLLIERY EXPLOSIONS, AND WEATHER INFLUENCES.—Writing on the 3rd inst. on "Colliery Management and Explosions," we contended that meteorological conditions greatly affected the safety of our mines, and that "explosions in mines are far more intimately associated with, and affected by, violent disturbances, atmospheric and otherwise, than is generally supposed." We also said "the intimate connection of storms and explosions are not yet sufficiently understood even by some of our principal mining engineers." When penning these remarks we certainly had no idea that they would be so soon and completely verified by one of the most eminent scientific men in the country; but such is the case. Mr. Scott, director of the Meteorological Office, in his evidence before the Treasury Committee, on meteorology (just printed), strongly asserts that "colliery explosions are due more often to meteorological than other causes." Recent investigations carried out by Messrs. Scott and Galloway lead to the belief that nearly 75 per cent. of colliery explosions, fatal and non-fatal all put together, are connected more or less directly with meteorological causes, some 50 per cent. being connected with changes of pressure, and about 25 per cent. being traceable to changes of temperature. It is Mr. Scott's opinion, shared by Mr. Galloway, that if warnings could be communicated to the colliery managers to say that on such and such a day they should not send the men down a great loss of property and a great number of explosions would be prevented. The difficulty of carrying this idea into effect is that in, for instance, the Glasgow district the collieries extend all over the district from Cumnock up to beyond Glasgow, and that as a signal cannot be hoisted in any one place which shall be visible everywhere, as in a harbour, the warnings must be conducted by individual telegraphic communication. It is a question of expense; and, again, there is a difference of opinion among the colliery Inspectors as to the possible value of the project; but, Mr. Scott explains, "colliery Inspectors are not all very well educated men." We feel satisfied that Mr. Scott will have done weight with colliery managers, and when "storm warnings" are forwarded from the meteorological offices especially, caution will be observed in the working of our mines.

ELECTRIC BLASTING AND SIGNALLING IN MINES.—An interesting lecture on the employment of electricity for blasting and signalling in mines was delivered at the Bristol Mining School, on Monday evening, by Mr. W. BLANCH BRAIN, of the Drybrook Iron Mine. After briefly sketching the history of electrical discovery he mentioned his own theory that he can demonstrate that Faraday was correct in assuming a relation between gravity and electricity, although his results were negative when he attempted to prove it. But it is in boring that Mr. Brain appears to be even more successful than in electrical research; his results are such that if they are generally obtained they will revolutionise mining and cause mining engineers to wonder. He has succeeded in bringing down 120 cubic feet of hard limestone rock with only 107 feet 11 inches of boreholes, or nearly 1 1/2 cubic feet of rock for each foot of hole drilled. The result is to some extent due to the assistance he derived from dynamite and electric firing no doubt, yet he is entitled to full credit for the quantity. The executive of the Bristol Mining School may be congratulated upon securing such useful lectures for their students. The lecture will be found in the Supplement to this day's Journal.

BRITISH DYNAMITE COMPANY (Limited).—We are informed that this company has transferred its patent rights and property to a new company just formed, under the designation of Nobel's Explosives Company (Limited). The alteration in the name of the company will not make any change in the directors, officials, or agents, who will transfer their services to the new concern. All the obligations of this company are undertaken and will be discharged by Nobel's Explosives Company (Limited). In making this intimation the directors tender their thanks to the consumers of dynamite throughout the country for the liberal encouragement shown to the company during the few years it has been in existence.

JOINT-STOCK COMPANIES.—A Parliamentary Return relating to joint-stock companies in the United Kingdom, formed and registered under the Companies Act, 1862, &c., has just been issued, from which it appears that in the year 1875, 1153 companies were registered with a proposed capital of £2,447,180., and 19 without nominal capital, making a total of 1172. From Jan. 1 to May 31, 1876, 478 companies were registered with a proposed capital of 24,056,520., and 82 without nominal capital, making a total of 560.

MINERAL INDUSTRIES OF VICTORIA.—The reports of the Mining Surveyors and Registrars for the quarter ending Sept. 30, 1876, for copies of which we are indebted to Mr. Thos. Couchman, the acting secretary for mines, have just been received, and show that there were 41,990 miners employed, of whom 16,169 Europeans and 10,997 Chinese were engaged in alluvial mining, and 14,725 Europeans and 108 Chinese in quartz mining. The estimated yield of gold in the quarter was 86,716 ozs. 7 dwts. from alluviums, and 138,192 ozs. 12 dwts. from quartz, making a total of 244,909 ozs. It appears that 181,596 tons of wash dirt yielded 7697 ozs. of gold, or at the rate of 4-5th dwts. to the ton, and 7527 tons of cement yielded 1500 ozs. of gold, or at the rate of 4 dwts. to the ton. There were 218 miners, other than gold miners, employed; of these 10 were argentiferous galena miners, 45 tin miners, 43 copper miners, 80 antimony miners, 6 ironstone miners, 5 lignite miners, and 29 slate and flag miners. Mining generally appears to be in a depressed condition. A lithogram of the rhytidocryon Wilkinsonii, 12 figures, accompanies the report, which is altogether a very interesting one.

COAL AND IRON IN THE UNITED STATES.—It appears from the report of the Massachusetts State Commission on Railroads that during the past year 151 miles of steel rails have been laid in that State, making 1144 miles out of a total of 3104 miles, or 37 per cent. of the whole. There is scarcely any new feature to report in connection with Scotch pig at New York. The stock has continued small, and there has been no improvement in the demand. Steel rails are quoted at New York at \$48 to \$50 per ton currency at the mill, and iron rails at \$35 1/2 to \$37 per ton currency. The coal trade has ruled dull at New York, notwithstanding that a considerable number of orders have been received from the East. Steel rails have ruled firm at Philadelphia, but there has not been much activity in the demand. The capacity of production is in excess of current requirements, and low prices make appreciable difference in the demand. There has been little change in iron rails at Philadelphia; the amount of business passing is comparatively limited. There has been more doing in old rails at Philadelphia, and sales have been made at somewhat higher prices. From Pittsburgh we learn that Messrs. Anderson and Passavant have contracted to furnish 3400 tons of crucible steel for the construction of the New York and Brooklyn Bridge. At Boston the rail market has ruled active. A Southern demand for iron rails is anticipated as soon as confidence has been re-established.

COPPER.—Messrs. White and Haskell, of New York, have forwarded to us a table of American copper statistics for the last eight years. On Jan. 1, 1869, the stock was 4465 tons; this remained about stationary in 1870 and 1871, was reduced to half in 1872 and 1873, recovered in 1874 rose to 4900 tons in 1875, and to 5360 tons in 1876. The production was 11,607 tons in 1876, and with the exception of 1871, there has been an increase each year, that for 1875 and 1876 being 17,400 tons. The American home consumption and export was about 11,500 tons in 1876, except 1873, showing an increase, until 1875 stands at 21,000 tons. The exports of 1876 were equal to those of the three preceding years combined, being about 5150 tons. The price on Jan. 1 was only 54d. per lb., above the lowest prices of the eight years. They estimate the stock on hand at New York on Jan. 1, 1877, at 3125 tons; stock at Detroit, and in transit therefrom, 446 tons 6 dwts.; to arrive from the Lakes prior to June 1, about 2465 tons 7 dwts. (though it is difficult to see how this connects with the annual production of 17,400 tons); production of

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REPORT FROM CORNWALL.

Feb. 21.—It is some time since there was so long a period during which there has been so little to report really worthy of consideration. There are, of course, always little matters of detail that might be noted, but of matters of moment the present time is almost wholly barren. Prices remain just where they were, and there appears to be no change either in the general aspect of trade or the particular relation of our own special industry.

The only general topic that seems to attract any attention just now, and that rather fitfully and spasmodically, is the propriety of smelters melting their own tin. Nothing really new, so far as we can see, has been urged either on one side or the other. It is necessary, however, to point out that smelting is one thing and speculation is another. If our smelters are also tin merchants, and are an accident of the smelting trade, not its necessary condition, and there are plenty of brokers who would undertake to dispose of the tin from Cornwall if it was once turned into metal. It should be remembered too that the present system of merchant smelting is comparatively a modern innovation, that originally mines smelted their own tin, and that then the smelter turned the black tin into metal and handed it back to the adventurers minus the returning charges, and it was only after their system had been long in vogue that the present one came in. The only practical objection that has been urged to the mines doing their own smelting and thus making their own profit of the operation has been the statement that it is necessary to mix together certain qualities of tin. This we have questioned, and it has been re-affirmed, but not as we before said, so far as appears outside the smelters' circle. It did not used to be necessary in the old time, and the quality of the metal has not so changed that it should be necessary now. Is the real solution of the statement this—that by a judicious admixture a better profit can be made of poorer stuff? If so, that is one thing, and the necessity of mixing quite another. It is not quite certain that long the experiment will not be tried.

We mentioned last week the Penryn foreshore case. Judgment has now been definitely given in favour of the corporation.

It is stated, and apparently on good authority, that negotiations are now in progress between the Great Western and the Cornwall Minerals Railway Company for the acquisition by the former of the latter concern. This would be an important purchase by the Great Western, for the Cornwall Minerals lines are an important network, commanding almost the whole china clay trade of the county, and they have seriously interfered in this particular with the traffic of the Cornwall line. The Liskeard and Caradon Railway Company pays its way, and this sets a good example to the other railways of the county. The dividends declared at the recent meeting were 5 per cent. on the one-third share, and 2½ per cent. on the original and new 25s. shares.

A serious accident has happened at West Arton Mine, resulting in the injury of two men through using dynamite contrary to instructions. C. Carlyon and W. James were engaged in the bottom of the 130 ft. level, and after having bored a hole placed a dynamite cartridge in the bottom and some powder above, and commenced tamping the hole; whilst so engaged it exploded. Drs. Angove and Butlin were promptly in attendance, and rendered the injured men every assistance. James has lost the sight of one eye, and Carlyon had a thumb and one finger of the left hand amputated, and was further injured in the breast and about the face.

REPORT FROM THE NORTH OF ENGLAND.

Feb. 22.—In both the iron and the coal trade, and throughout most of the allied and collateral trades, there is a continuance of depression which begins to deepen into the most alarming appearances. So far, indeed, as the coal trade in particular is concerned we hear it stated on every hand that there never were such times, and that it would be impossible for the oldest hand to remember a time when the outlook was so entirely unrelieved by a single ray of hope and light. This state of matters is beginning to be severely felt both by employers and employed, and the troubles and difficulties which both alike are now experiencing tax all their endurance and resources. Loss is being incurred on every hand. Some 5000 to 10,000 men are employed in and around the Durham collieries. A heavy drain is being made upon the resources of the Union. Employers are generally calculating as to whether it would not pay them better to close their pits altogether. Prices are failing to show any sign of improvement, and altogether the outlook is one of the dreariest and most desponding kind.

In these circumstances steps are being taken to effect not only a further reduction of wages, but an increase of working hours as well. On this proposal conclusions are likely to be tried during the next few months between the miners and the mineowners. The former may not object to refer to arbitration a suggestion that wages shall still further be reduced, although that would imply the restoration of the wages paid in 1871. But it is a different thing with the working hour, which have all along been regarded as settled for good on the basis now adopted—about six and a half or seven hours from bank to bank. The adoption of longer hours by the hewers would enable them to earn more wages, and it would enable the owners to get a larger output relatively to the expenses of management, engine power, wear and tear, &c.; and in this respect there can be no doubt that it would be highly desirable. The provisions of the Mines Regulation Act would of course prevent the possibility of a return to the customs of 10 years ago, the hours of boys having been reduced permanently to 54 per week; but while it would limit the hours during which coal could be drawn, it would not materially interfere with the actual production of coal in the pits, and arrangements could be made for meeting the difficulty as to the drawing of the coals. There seems to be a general concurrence of belief that it will take both employers and employed all their time, and the exercise of much mutual forbearance, to tide over the difficulties now pending and threatened; and it is not too much to hope that the men will be wise enough to accede to the working of longer hours, or other arrangements of a kindred kind, with the view of reducing the working cost of raising coal.

The deputies question appears to have come nearer a strike than anticipated in my last letter. The return made up to a few days ago showed 13,872 in favour of a strike, and only 13,212 against one, so that the personal voting was in favour of resorting to the arbitration of force. But the rules of the Durham Miners' Association require a clear majority of two-thirds of the votes of the Association before a general strike can occur, so that the actual result will in the present case be one of "no strike." There are, however, in the Durham Miners' Association at the present time a lot of highly combustible material which the slightest accident may ignite. The men seem to have the impression that they cannot be worse than they are; and if that is true to any extent of the men, it is much more so of the owners.

The Delaval Benwell Colliery was stopped on Saturday, owing to the slackness of trade. The Dronefield Silkstone Colliery is about to be laid in until the revival of trade, or a reduction in the rate of wages, enables the owners to commence work again. At Wheatley Hill the miners have received notice to quit in a fortnight, and other 800 men and boys will thus be thrown idle. At Delaval, Newham, and Cranlington the pits have now been closed for several weeks, and there is no present prospect of their being re-opened. The Hartford Daisy Pit, in Northumberland, has been stopped, and several other pits are being laid in.

In the Iron Trade there is nothing new to report. There was little or nothing done on Tuesday at the weekly iron market at Middlesbrough. Prices were even less firm than last week, No. 3 being quoted as low as 44s. per ton, while some sales took place at 43s. per ton net cash on delivery. It is expected that prices will rise with the advent of the spring navigation, and makers are

anxiously awaiting that prospect; but in the main the chances of improvement are even less hopeful now than they were some time ago.

In the county of Durham the miners have determined to take from their general fund a sum of 5000l. to form the nucleus of a relief fund, which they will afterwards maintain by an extra contribution of twopence per fortnight per member. Heretofore the Durham miners have not allowed anything to men thrown out of employment from slackness of trade, although they have made allowances to men thrown out of work by accidents to plant, &c.

The directors of Bolekew, Vaughan, and Company have decided to recommend a dividend for the year 1876 of 7½ per cent., including the interim dividend paid on October 1.

The finished iron trade is deplorably slack in every branch, except that of plate making, and even plate makers are doing less than they were. On the Tyne some 35 vessels are now being built, nine of them being at Palmer's well-known works.

A dispute is threatened at the Pegswood Colliery, in Northumberland, owing to the masters having introduced a new system of weighing the round coals to avoid the labour of weighing them in the gross, and the trouble of such arrangements at the pit head as the Welsh system requires.

Mr. Thomas Fenwick, iron and mineral merchant, Middlesbrough, has presented a petition for liquidation. The failure is attributed to losses incurred by the failure of other firms.

REPORT FROM NORTH AND SOUTH STAFFORDSHIRE.

Feb. 22.—The slight improvement noticeable last week at a few finished ironworks is not in those instances this week maintained, since orders for high-class finished iron are more needed now than at the date of my last. In less valuable samples there are instances in which a little more is doing, but generally buyers hold back, whether as consumers or middlemen, the former using up all present supplies, and the latter keeping down stocks rather than buy again whilst the market remains in its present unsettled condition. Prices of most finished iron must, therefore, be still reported as weak. Very little business is doing in pig-iron, whether in respect of Staffordshire or of foreign brands, and the quotations remain firm for Staffordshire, but with a tendency to drop for some common Lancashire qualities. Coal is not moving to any notable extent either in respect of manufacturing or of household samples. As to the latter the reduction declared by the Cannock Chase firms is pronounced to be too little to have much effect in stimulating business.

The local Exchanges have within the past week or nine days been a little concerned respecting a small firm known as the Regent Ironworks Company. It is a limited concern, and carries on business near to Bilston. Efforts were being made to adjust matters, but they have been unsuccessful, and on Saturday next a petition for the winding up of the company will be heard before the Master of the Rolls. The petitioning creditors are Messrs. Richard and Isaac A. Thompson, engineers, &c., of Bilston. The company consists of only a few shareholders, and they are mostly local men.

Mr. J. Capper, the secretary of the operative ironworkers on the Mill and Forge Wages Board, has issued a circular to the ironworkers of South Staffordshire and East Worcestershire urging them all to associate themselves with the Wages Board, of which he speaks in high terms, saying: "In time to come we shall all have cause to rejoice and say that arbitration has proved a blessing," not only to the employers and the employed immediately concerned, but likewise to the shop keeping interest.

The Cannock and Huntington Colliery Company are calling up a further 2s. per share, making 6s. paid upon the 20s. shares. At present there are sellers at 2s. There are very few buyers in the market for any of the coal and iron shares quoted on the local Exchanges. Spon Lane Colliery 10s. shares, upon which 8s. 10s. has been paid, were sold on Wednesday last at 4s. each. Whilst 3s. 15s. is offered for the 10s. Chillington Iron Company shares sellers are holding off for 4s. 5s. The Mid-Cannock Colliery shares keep at a premium; the 20s. shares, 10s. paid, being offered at 13½. John Bagnall and Sons (Limited) iron shares of 10s. are offered at 3s. 17s. 6d. without securing buyers, and so as to the Darlaston Steel and Iron Company shares which are offered at 1s. 15s. The Pelsall Colliery shares of 20s., with 15s. paid, are in the market at 8s. discount.

The South Staffordshire and East Worcestershire Institute of Mining Engineers tenth annual meeting was held on Monday in Dudley, when the presidency, vacated by Mr. Thomas Latham, fell to Mr. Thomas Parton, who had been vice-president; Mr. David Peacock became vice-president, Mr. Thos. Brettell, treasurer, and Mr. Alex. Smith, secretary. The council are—Messrs. (Thomas) Latham, Blakemore, Field, Bayley, and R. Latham.—[A full report of the proceedings appears in the Supplement to this day's Journal.]

The subsidence at the limestone pits at Dudley is a centre of attraction for numerous spectators, but the dilapidation of the dwellings has not increased upon the week.

I am unable to report any improvement in the coal and iron industries of North Staffordshire. The supply of coal is in excess of requirement. Neither in the calcined nor the raw ore trade is the demand at all equal to capability of supply. The restricted make of pigs is being pretty much used up, though stocks are slightly increasing at some furnaces. The plate mills are very indifferently supplied, and, owing to the slackness in the export business, bars are moving only slowly, whilst hoops experience the severity of the competition of Warrington firms.

Mr. J. E. Davies, the umpire in the wages dispute in the pottery trade, has made his award in favour of the operatives, considering it inexpedient that any reduction in wages should be made, or that the contracts between employers and their men entered into last Martinmas should be disturbed.

A case of considerable importance to the tin-plate trade is at present before the Vice-Chancellor, the question raised being the novelty of the decorated tin-plates made under Messrs. Flower's patents by the Neath Tin Decorating Company. The practical efficiency of Messrs. Flower's process is not doubted, but the point is whether it differs sufficiently from the ordinary Birmingham japanning process to constitute a patentable invention. It appears that Messrs. Lloyd and Son purchased the decorated plates of Messrs. Flower until a disagreement as to price occurred, and then commenced manufacture on their own account. The defendants' case will be opened on Tuesday.

REPORT FROM MONMOUTHSHIRE AND SOUTH WALES.

Feb. 15.—The slight improvement noted last week as having taken place in the iron industry continues, and many of the local works present a better appearance than has been the case for some time. It is to be regretted, however, that prices for finished descriptions, and particularly rails, remain at the same low ebb. While this is the case it is too much to hope that the works now closed will be re-started. The enquiry for pigs is a little improved, and reductions are being made in stocks. For bars, however, the enquiry is limited. Clearances during the week have been rather small, and have been principally to Turkey and India. Orders are also in hand for Australia, Brazil, and China. There is no doubt that more trade will be done in the last-named country as time goes on. The aspect of the steel-works is again of an encouraging nature. For tin plates, however, prices are low; but work is proceeding with more regularity. The erection of steelworks at Rhydyfelin is being carried on as quickly as possible. There is very little new to report with regard to the coal industry, but the demand for steam coal is well maintained, and in some instances a slight improvement in prices has been observable. In times like these one must be satisfied with the smallest crumb of comfort. House coals are in a little better request, and the pits generally are sending a fair quantity to bank. Little is heard now of strikes in the district, but there are one or two exceptions. In two instances the men object to the "Billy Fairplay" system. At the Forest Level, Mountain Ash, the men are working out a month's notice; while at Tredegar, at the new pits, a number of men are on strike. The Mountain Ash men have agreed to leave the matter to the Conciliation Board. A number of colliers at Victoria, Monmouthshire, will have their wages reduced shortly, and it is believed

that they will submit. Messrs. Davies' Oakwood Collieries have been idle a long time, but now the men have gone to work again, the dispute as to wages having been amicably settled.

At Tredegar Police Court Mr. J. N. James, the certificated manager of a pit at Sirhowy, has been fined 40s. and costs for neglecting to supply the mine with adequate ventilation.

The committee who have the management of the Risca Widows' and Orphans' Fund have just met and presented their annual report. The fund was formed some 17 years ago at the time of the great explosion at Risca. A balance of 1558l. remains in hand, and the number of recipients now is 17.

At the Monmouthshire Railway and Canal Company meeting, held at Newport to-day, dividends at the rate of 6½ per cent. per annum, and 5 per cent. per annum, for the half-year on ordinary stock and preferential stock and shares respectively, were declared. Lord Tredegar presided.

The case of the Caerphilly Colliery Company has been before the Court of Appeal. It was an appeal by Sir Edwin Pearson against an order for winding up the company, by which he was compelled to pay 125l. to the liquidator in respect of some shares. The appeal was dismissed with costs.

REPORT FROM DERBYSHIRE AND YORKSHIRE.

Feb. 22.—The Iron Trade of Derbyshire has undergone but little change for some time past, and, although far from being so good as could be desired, it will undoubtedly bear favourable comparison with any other district. The production of pig-iron has been well kept up, although the full number of furnaces is not in blast. A little more is being done at some of the fourtries, whilst the Bessemer works at Driffield have been doing very well. House coal has been quiet for some time past, and so also have steam qualities, whilst prices of every description are unusually low. It is this state of things that led the colliery owners some days since to give their men notice to leave, preparatory to a reduction of wages, whilst at some places the men accepted the reduction without much hesitation. It may be said that a good many of the colliers in Derbyshire are in no way connected with the Miners' Association, having left it last year when they found that all the capital had been swallowed up in the capacious maw of the Shirland Colliery, and that there was nothing to fall back upon in the case of a strike. The Masters' Association is now a powerful organisation, backed up as it is with plenty of capital, so that it is in a position to dictate terms to the men. The concession asked by the members, it is conceded on all hands, has been particularly moderate, more so, indeed, than might have been expected from the state of trade. Of the advances made since 1871 the men up to the present time have a residue of 11½ per cent., and of this they are only asked to sacrifice 6½ per cent. In connection with the reduction a circumstance has occurred which should not go unnoticed. Mr. C. Markham, the able managing director of the Staveley Coal and Iron Company, has offered to those men who at present belong to the Miners' Union that if they will leave it he also will sever his connection with the Masters' Association. There are something like 5000 men employed by the company, who have made a model place at Staveley, and spent many thousands of pounds in promoting the educational and social wants of the workmen and their families. The sacrifice on the part of Mr. Markham must be very great, but he evidently desires to see the workmen independent, and not the mere machines of two or three well-paid officials. I have very little doubt but what the offer will be accepted, more especially as the Unionist colliers at Staveley are the reverse of numerous.

There is a little more doing in some few branches of the Sheffield trades, yet business generally has still a gloomy appearance. Russia has sent in some orders for ordnance, and the armour-plate mills have been running tolerably well. The activity in some of the shipbuilding ports has led to an increase in demand for plates, whilst there is also a rather better enquiry for those for boilers. Foundry material is in fair request, but most branches of the steel trade, with the exception of Bessemer rails, are still very quiet. In South Yorkshire the coal trade is still in a depressed state, without any signs of improvement. In house coal the demand is so small that at most of the collieries the men are not working more than three or four days a week, and it is only by that means that stocks are kept down. At nearly all the collieries notice was given at the close of last week that the men would be required to submit to a reduction of wages. At several collieries the proposal was at once agreed to, so far as 6½ per cent. was concerned, whilst Earl Fitzwilliam's men agreed to a reduction of 9 per cent. With respect to the other collieries under notice, a meeting of delegates was held at the Miners' Hall, Barnsley, on Monday, when it was agreed that the men should accept the 6½ per cent. reduction. This, it may be said, was a foregone conclusion, for no other course was open to the men.

The establishing of a Permanent Fund for the relief of the sufferers by colliery explosions in the West Riding is making very good progress. Meetings have been held during the week under the presidency of Earl Wharfedale, and the miners have shown every disposition to contribute towards it.

A NEGLIGENT COLLIERY DEPUTY.—At Barnsley, on Wednesday, William Brown, a deputy at the Oaks Colliery, belonging to Messrs. Charles Cammell and Co. (Limited) was charged with neglecting to see that a proper number of sprags were set in a certain part of the above colliery on the 15th inst.—Thomas Briggs said he was under-viewer at the Oaks Colliery. Defendant went on duty about five o'clock on the morning in question. His work was to see that every man was carrying out the rules of the colliery, and to examine the working places. He would have to go past No. 51 bank, where a man named Patterson was at work, and ought to have examined the place. That morning about 5 tons of coal fell, nearly killing the man Patterson. There was only one sprag for 8 yards, and the rule was that one sprag be set for every 6 ft. of roof. He spoke to defendant about that, and he admitted that there were no sprags set.—Mr. James Wilson, the manager of the colliery, said the defendant had been one of his deputies for over five years. On the morning in question, after the accident had taken place, the Inspector of Mines, Briggs, the last witness, himself, and the defendant visited the place, when the defendant said he had gone through the place that morning and there were no sprags set, but he thought Patterson was going to get the coal down.—In defence the defendant said that when he passed through the place where Patterson was working he thought the man was going to get the coal down. There were no props under the coal which fell, but there were two sprags under the loose end. The coal had been spragged, but the man had taken the sprags out to get the coal down.—The magistrates said they considered it a most serious case, and they should make an example of the defendant, hoping it would be a caution to others. Defendant was then committed to goal for two months, with hard labour.

TRADE OF THE TYNE AND WEAR.

Feb. 21.—There is little improvement in the state of any of the trades here. Collieries are still being laid off, and should any revival of consequences take place the output may be brought near the demand sooner than is expected. The mill winter has had a bad effect on the house coal trade, and this is, of course, the dull time of year for the steam coal trade. This, in addition to the convulsion or difficulty caused by the introduction of the new systems of weighing the coals for the payment of the men, has brought the trade into a most depressed state, but as there are no stocks on hand the works being only put on to supply actual orders, there must be a demand for this coal when the Baltic is again opened out. And as the "Billy Fairplay" difficulty will be gradually overcome, the summer business for Hartley steam coal ought to be a very fair one, unless the demand should prove bad beyond all former experience. It is extremely unfortunate that this difficulty should occur in Northumberland at the same time that the demand for manufacturing coal produced in Durham is so bad, as a large number of men are now out of work, on the Tyne especially—that is, miners, fitters, smiths, &c., and all other artisans. At present the only works fully employed are the gas coal collieries and a small sprinkling of coking coal works. A few of the best house coal works are working about nine days per fortnight. The other works, almost without exception, are working very short time. The men at the Axwell Park Colliery got notice on Friday—that is, the whole of the men and boys at surface and underground—to leave, as it is the intention of the owners to stop the place entirely in a fortnight. This is a new work opened out only four years ago; it is situated on the Derwent, five miles west of Gateshead. The Blaydon Main Colliery

adjoining is doing little, one of the seams there having been stopped. Several large collieries have been stopped in the district, and the Dudley Colliery is now to be stopped. This is a large place belonging to the Cramlington Coal Company, but another pit belonging to them, which has been laid off some time, is to be re-started, and most of the Dudley men will be employed there.

The determination of the Durham coalowners to demand a further reduction of wages, and also a re-adjustment of the hours worked, has had a most crushing effect on the men, coming so soon after the late reduction and the serious quarrel respecting the deputies. That they will resist both proposals may be taken as certain, and that to the utmost. It does not appear that the masters get any benefit from the reduction effected in the wages of the miners—the fact appears to be that coals are so plentiful that reduction in the cost of getting them only induces the masters to force increased sales by offering the coals at reduced prices. The average wages of the men in Durham are now below 5s. per day, and it cannot be expected that they will willingly submit to further reduction, unless the hours are increased to enable them to put out more coal, and thus earn good wages as at present. The necessity for longer working time per day is urgently needed in hard coal collieries, but two-thirds of the Durham collieries are soft coal, and in reference to those this point has no great importance. As many collieries have been stopped in Durham and Northumberland a large number of men are now out of employment, and payment made to those men from the funds of the Miners' Union is becoming a very serious matter. In Durham there are 2000 men out of employment at present, and in Northumberland about 3000 are in the same position. It is now proposed to form a separate fund in Durham for the support of miners out of work. The executive of the Miners' Union propose to take 5000l. from the general fund, this sum to form a nucleus of a relief fund, and that the fund be afterwards kept up by the payment of levy (extra) of 2d. per fortnight per member. It is generally said that the last straw breaks the back of the camel, and the miners' backs must be very strong if they continue to bear all the burdens put upon them.

There is a settled conviction that trade will not improve here until matters are more settled in the East. An extensive trade has been carried on with those two great empires—Turkey and Russia—and adjoining States. The exports to those parts of railway iron, bridge work, &c., have always been large, and when the Serbian war broke out heavy orders were on hand for railway bridges, &c. Many of these orders had not been completed, and will be held in abeyance until a more settled state of things is assured. The Iron Trade is in a most unsettled state, and the business so limited that it is almost futile to give quotations. The usual figure of makers is—No. 1, 48s. 9d.; No. 3, 45s. The deficiency in the continental demand is the main cause of the depression in the market, as there are extra deliveries from Scotland. The demand for the South and inland has been flat. Foundries are not so well employed as they have been of late. Plate mills are still well employed. The prices of manufactured iron are nominally unaltered.

Cook and Hillman have got the old works of Abbot and Co., near Gateshead, to full work, in addition to their old works near the same place, where they are well employed in making sheets. Those produced are mostly thin sheets, made by no other firm here. These sheets are similar to the sheets manufactured in Staffordshire.

The members of the Northern Institute of Mining and Mechanical Engineers have arranged to have an excursion to Durham and the district next month. The Bearpark and Langley Park Collieries will be open for inspection. These new collieries are now well advanced, and as all modern improvements and machinery have been introduced, the trip will be highly interesting and beneficial to those members who can attend. A large number of members are expected to attend, as the Bearpark is considered a model colliery, both in reference to the machinery and arrangements at the surface and underground. The excursion is to be made on Thursday, March 8.

An interesting experiment has been made of a new detaching hook at the North Lothian Mines. It was witnessed by a large number of gentlemen and mining engineers, amongst whom were Mr. T. Lee, Eston Mines; Mr. D. H. Dixon, Brothton Mines; Mr. G. Lee, Liverton Mines; Mr. E. Hann, Brothton Hall; Mr. G. Bell, Boosbeck Mines; Mr. J. Thompson, South Skelton Mines; and several miners. Previous to starting the engine some of the spectators stationed themselves in the head gear, so that they might have a clear view of the action of the hook as it detached the rope from the cage. All being ready, the signal was given to the engineman to start the engine at full speed. The rope flew over the pulley, leaving the cage safely suspended by the hook to the ring fixed for that purpose. The hook was securely locked to the ring by a wedge drawn fast between the jaws. This arrangement was considered by those present to be the safest and best method of locking detaching hooks yet invented. The cage was then re-attached to the hook, and lowered to the bottom of the pit, when the other cage was drawn up with the same result, the hook safely locking itself to the ring, to the entire satisfaction of all present. The hook, which is the invention of Messrs. Hann and Ramsay, is constructed on a new design and improved principle, which, it is claimed, give it a decided superiority over any detaching hooks yet in use.

A NORTHERN INVENTOR—THE RAILWAY BREAK SYSTEM.—The frequency of railway accidents caused by the insufficiency of the present break system lends interest to the fact that Mr. William Huntley, of Dundee, having given his attention to this subject has completed and placed at the disposal of the public an apparatus which promises to be perfectly adequate to secure entire and instantaneous command over a train in motion, and thus be the means of obviating the many lamentable casualties that are occurring from time to time from the want of such power. Mr. Huntley has now had more than 50 years experience as a practical engineer. The "continuous grip brake" and the "valve regulator" he has invented prove that this long experience has borne good fruit. The "valve regulator" gives the driver complete power over his engine, enabling him to stop its advance without reversing it, and wherever it has been adopted it is found to answer admirably. The "continuous grip brake" is an invention of even more importance, and we should state that Mr. Huntley has resolved not to patent it, but to place it freely at the disposal of the railway companies, with the humane desire of doing all in his power to benefit the public by preventing accidents. A description of it, which has been published at Dundee, states that it is based on a simple principle, and is capable of being universally adopted. It has also the advantage of not interfering with the present break arrangements, and, therefore, may only be used as an auxiliary break when specially required, it being also ready for instant use. The break can be applied continuously over the whole train by the driver from the engine by touching a lever. It can also be applied from the signalman's cabin, and the train be brought to a standstill at a given distance from the station. In order to do this a lever is attached to the permanent way, and worked along with the danger signal, to the chain or rod of which it is attached. When the signal is raised danger is indicated, and the lever at the same time brought into position. Should the driver, therefore, either through fog or any other cause, fail to see the signal, the breaks will be put on continuously throughout the whole train without jolting, jarring, or any unpleasant vibration whatever, bringing the train up in a shorter time than any other break that has yet been tested. It is confidently stated that by the combined use of this and the valve regulator a train could be brought to a standstill in nearly its own length. These are very important facts, and well deserve the attention of the engineering world and the general public.

EXPLOSIVES.—For the improved manufacture of explosives Messrs. MACKIE, FAURE, and TRENCHE, of Faversham, propose to use various kinds of paper-making materials in lieu of cotton, &c. Esparto grass, or hemp, flax, straw, hay, jute, the leaves and stems of the agave, yucca, and pineapple, the fibre of the cocoa nut husk, and of the leaves of the various varieties of the palm, rags or paper pulp, and wood fibres generally are first purified by boiling with caustic alkalis, and afterwards decoloured by chlorine, as in the manufacture of paper. These materials are then to be converted

into nitro-cellulose by immersion in mixed nitric and sulphuric acids, according to the known process for making gun cotton, or as practiced in the manufacture of Schultze and Muschamp's powders. When the esparto or wood or other fibres are thus converted into nitro cellulose, they purify or otherwise well wash the pulp to make it pure, and mix it thoroughly with its own weight about of nitrate of baryta, and while still in a damp state they mould this mixture into compact and dense charges, which are afterwards put to dry. These charges have a central hole to receive a detonating cap when they are to be fired. In order to protect the charge against rough usage and moisture they cover each charge with a wrapper of paper or canvas and a coating of paraffin. The paper wrapper (if any) has a neck provided with a length of copper wire or string to fasten the capped fuse into the central hole of the charge.

PEAT COKE AND CHARCOAL.

The conversion of peat into coke or thoroughly carbonised charcoal in a consolidated state has always presented considerable difficulty, but Mr. N. D. SPARTALL, of Liverpool, claims to have discovered a remedy. The sods or blocks of peat as they are brought from the bog are compressed in rolls or blocks by a screw or hydraulic press, the peat is then placed in horizontal or vertical retorts set in enclosed fire-brick furnaces with sloping fires, so that the flames therefrom surround the retorts. Instead of allowing the gases of the coking peat to escape from the retort through pipes he retains them therein, and utilise them by causing them to permeate the peat itself as it is being heated in the retorts. The heat of the furnace and of the gases evolved from the peat itself in the retort is sufficient to carbonise the peat thoroughly, and to embrace therewith the tarry substance and gaseous combustible matters contained in peat. A very small pipe at the top of the retort can be provided with a valve, which may be made to open or shut and allow such little escape of aqueous vapour only as is required to prevent any accident. By making the retorts horizontal in the shape of large cylinders he can press the peat in the tubes as the mass is gradually charred by the gases and the heat of the fire. The charred mass is forced out in solid rolls of short length at the other end of the retort; or if the retorts are placed vertically he provides them with feed hoppers at the top, and a false bottom to allow the contents to be dropped from below or through a man-hole or man-hole doors at the sides of the retorts.

At a certain stage of the charring process the fires should be drawn to prevent the peat inside the retorts from igniting, and if left for a short time to gradually cool the gas will permeate the peat completely, and then the material can be taken out. To make coke (when the charring has reached an advanced stage, but long before there is any danger of ignition) he allows the charred peat to empty itself into cold water, or he uses a jet or jets of cold water, which is thrown on the charred peat when in a heap. This carbonised peat is the best material that can be used for the manufacture of best kinds of sheet or bar iron, such as Swedish iron, fire-resisting, and particularly for boilers, and this process will be the means of reducing its cost very materially.

MINERS' SAFETY LAMPS.

A curious method of permitting the trimming and adjusting the wicks of miners' safety-lamps, so as to ensure thorough convenience and efficiency whilst rendering it altogether unnecessary to open the lamps for the purpose of trimming, was provisionally specified, but the invention has not been patented, by Mr. W. GALLOWAY, M.E., of Carlisle, the object being to avoid the inconvenience and loss of time hitherto experienced from the necessity of taking lamps from the part of a mine where they are being used to safe "lamp stations" for trimming. The invention is also claimed to be advantageously applicable to any lamps whenever it is desirable to open the lantern or casing thereof for trimming—as, for example, in the case of signal or other lamps exposed to wind. The trimming wire is fitted to slide through a hole in a ball, which is fitted into a socket provided at any suitable or convenient part of the lantern or casing of the lamp. In the Davy lamp the socket and ball may be placed at the side on a level near the top of the wick; and in the Clanny lamp the socket and ball may be placed just above the glass cylinder which encloses the flame. The inner end of the wire may be bent in any manner that may be found suitable for removing crust from or trimming the wick, and for raising and lowering it. The parts should be fitted so as whilst allowing of angular movement of the ball and wire, and sliding movement of the wire, to be practically air-tight.

Another invention for miners' safety-lamps, the novelty of which it is not easy to discover from the specification, has been patented by Messrs. E. and J. GARDNER, of Berners-street. The lamp appears to be a modification of the old Howden and Thresh lamp, some alteration in the construction of which was made some years since by Messrs. Hall and Cooke, of Birmingham. According to one of Messrs. Gardner's arrangements the lower portion of the lamp and the exterior cylinder is formed of metal, or of any other suitable material, and is perforated to admit currents of air, and these perforations are protected within and without this exterior cylinder by wire gauze. The air from without passes through the wire gauze and the perforations through suitable air-ways or passages to the lower chamber of the lamp. The atmospheric air admitted in this manner through the gauze and perforated metal cylinder to the lower chamber is free to circulate through the lamp and lamp burner. The top of this chamber forms the oil container of the lamp; the lamp is concentric to the outer perforated cylinder, so that there are air-ways existing between them, which air-ways lead to the lower chamber. The lamp is made so that the burner of any convenient form admits the supply of air to the flame on its inner and outer surfaces, and thus fully oxidises the fuel, and thereby obtains a larger and purer flame; a suitable glass chimney, if needed, is placed over the flame, the same being so fastened that it cannot fall off. A glass cylinder protected by suitable guards is mounted on the lower portion or stand of the lamp in any convenient way. The glass cylinder extends to a reservoir which forms the upper and inner portion of the lamp, and is supported by suitable pillars and supports connected with the lower part or stand of the lamp in a way to be hereafter more fully described.

The upper reservoir and oil container is of a double cylindrical form—that is to say, it has a tube or channel through the centre thereof for the passage of the products of combustion, and the exit of which is allowed through the cap or cover of the lamp. This cover of the lamp is provided with a transverse passage or channel to allow the products of combustion to pass through the exterior wire gauze casing and cover. The upper reservoir contains the oil which is supplied to the lamp and burner automatically. It has descending from the bottom thereof two or more vertical tubes, which dip into the before-mentioned lower reservoir (or lamp and burner) to a certain distance, and through which the oil descends into the latter. The lower reservoir being closed at the top entirely, or with a valve, a pressure is exerted upon the oil contained therein by that which descends from the upper reservoir, and a portion of the oil is conveyed by suitable appliances to the wick. The means of combustion and the production of illuminating power is thereby obtained.

Sometimes they modify the arrangements by placing the reservoir or receptacle for the oil entirely at the bottom of the lamp, the same being surrounded by concentric metal outer and perforated cylindrical casings of wire gauze, through which the external atmospheric air is admitted. The apertures provided at the lower part of the stand of the lamp being protected by wire gauze, the air is free to pass to the lower air chamber through the burner or burners, and through the wire gauze casings of the apparatus. Currents of air are admitted through a tube or tubes or channel or channels provided in the centre of the oil reservoir for the supply of the necessary means of combustion to the wick. The wick is supported by suitable supports or holders, and is surrounded by a glass chimney, if required, the whole being protected by a wire gauze cylinder or cylinders in the usual way. Above the oil reservoir is sometimes placed a glass cylinder protected by suitable wire or other guards, and on which is mounted the wire gauze cylinder or cylinders forming the upper

part of the lamp. The whole is surmounted by a metallic cap in the usual way to admit of the convenient escape of the products of combustion.

In both modifications the wicks employed may be of any convenient form or material, such as asbestos or wire, or similar to those used in ordinary lamps; air is admitted to each side or to the exterior or interior portions of the wicks or wick, and any description of oil, including mineral oil, may be used, or mixtures of mineral and vegetable oils. We prefer, however, to employ a mixture of camphor and mineral and vegetable oils—as, for example, equal parts of colza oil and paraffin or petroleum oil, in which has been dissolved a suitable proportion of camphor, so as to produce a solid white flame without smoke. The use of the said wicks or wick, and of such oils or mixtures, is rendered possible by the before described arrangements for the supply of atmospheric air for the purposes of combustion; they do not, however, claim or consider the employment of such oils or mixtures as forming any part of or as being included in their invention.

THE RAILWAY COMMISSION.

That it is the duty of the Government to legislate for the safety and comfort of the public is a postulate all will readily grant. Public companies and private factories, workshops and collieries, railways and canals, and the whole manufacturing and commercial world, all have to bow to imperial sway, and submit to be hedged round about with laws, rules, and regulations, professedly enacted out of respect for the safety of those employed therein, or of the public generally. We yield to none in our desire to support the Government in their laudable anxiety in this direction, provided it can be shown that the means suggested are feasible of adoption, and if adopted would secure the end in view. For years past we have advocated and cordially supported all practical measures for the more safe working of our collieries and mines, and for stringent rules and regulations affecting our factories and workshops, where the necessity for such has been shown; but we have at the same time resisted, and still resist to the utmost of our power, that ever meddling grandmotherly interference with our mining and staple industries which impedes and hampers trade without at the same time throwing greater safeguards around the connected therewith. Whilst admitting to the greatest extent that it is the duty of the Government to legislate for the life and safety of the public, we contend that before vexatious interference with vested interests is enforced a substantial reason for such interference should be proved; and, secondly, that the regulations sought to be enforced are not only feasible of adoption, but would bring about the desired remedy. After three years of anxious enquiry and arduous work, and an examination of no less than 366 witnesses of all grades and classes, the Royal Commissioners on Railway Accidents, appointed in June, 1874, have made their report. We pay every deference to the document, and the very able members of the Commission; but to our mind the fable of the mountain in labour and bringing forth a mouse has been exemplified over again; for whilst the Commissioners state that they "are unanimous and decided that no legislation is desirable which would impair the responsibility which the law imposes upon railway companies to provide for the safety of their traffic," some of the suggestions which they make are obviously to the interests of railway directors and managers to carry out, and can safely be left to them, whilst others are not feasible, or if so would sacrifice the dividends of all lines for several years to come—a consummation which the most zealous can scarcely expect to be realised.

We are very far from inferring that accidents upon railways are not occasionally traceable to preventable causes, and very possibly the long continuous hours which the servants have to remain on duty is responsible for many sins of omission and commission, and a luxury of duty; but railway travelling after all is by far the safest mode of transit. When we remember that during the year 1875 no less than 507,572,491 passengers were conveyed over the network of our railway system, with its complex machinery, the great wonder is that far more lives are not lost, deplorable as that loss of life undoubtedly is. We recently gave statistics clearly proving that a great proportion of the lives yearly lost arises from persons own misconduct or want of caution, and in cases as constantly occur no legislative enactment in the world, nor railway supervision however careful, will prevent. The report of the Royal Commission suggests that discretionary powers should be conferred upon the Board of Trade to enforce the extension of sidings and stations where the accommodation is inadequate; to enforce the adoption of the block and interlocking system where necessary for the safety of the traffic; to restrict the speed of trains upon any line where high rate of speed is unsafe; and to supply all trains with sufficient break power to stop them under all circumstances within 500 yards. These and a few minor recommendations are the outcome of the three years' labour of the Royal Commissioners—recommendations which we undertake to say the various managers and directors will gladly carry out—in their own interests—when advisable and feasible without legislative enactments and may be safely left to them for adoption. Even the Commissioners are not unanimous in their views, several declining to sign the report upon various grounds, an evident proof either that they consider it incomplete or impracticable, or would involve such a sacrifice of railway interests as to render it impossible of adoption. We very much question, for instance, whether any break has yet been proved of sufficient power to pull up a heavy train going down a declivity with greasy rails and sleeting rain within a distance of 500 yards, and yet the Commissioners recommend that every train should be supplied with sufficient break power to stop them "under all circumstances," a desideratum much to be wished for, but which we are afraid is, at present at all events, impossible of attainment. The report of the Royal Commissioners is valuable as containing much information as to the causes and prevention of railway accidents, and affording an indication to railway directors where reform is needed, but the practical means of adoption are not so easily to be carried out. We may rest assured that railway managers and railway directors are fully alive to their responsibilities as to the safety and lives of their passengers, and anxious to adopt every means to further secure so desirable an end. Railway accidents, as every other accident, are the most expensive calamities that can possibly happen; and as the law courts daily prove that railway companies are liable to pay heavy compensation for injury and loss of life, it is a guarantee that no means feasible of adoption will be spared to lessen danger. Doubtless many of the suggestions of the Royal Commissioners will be duly carried out—such as the extension of stations and sidings, and the providing foot-boards and foot-bridges, but these things would require such enormous outlay that we can only expect them to be done gradually. Railway interests are so intimately associated with the recommendations that we may safely leave them for adoption to the managers and directors, assured that the welfare and safety of the public are their first considerations, and will receive as hitherto their most anxious and careful attention.

COLLIERY ACCIDENTS.—In the House of Commons, on Monday in answer to Mr. Macdonald, Mr. Cross said it was true that eight days before the final inundation of the Home Farm Colliery, near Hamilton, in the county of Lanark, a fall in the roof had occurred in the extreme workings; that in consequence of that fall the work of a seam was stopped from the inflow of water, but the men went on working in the middle seam. The principal Inspector of the district visited the mine during the whole of the week. The Inspector was not aware of anything having occurred in the mine until the morning of the accident, no notice having been given to him of the water having got in eight days before. But he (Mr. Cross) was told that the persons in charge of the mine did consult the Duke of Hamilton's mineral agent, who was a gentleman of great skill and experience. That gentleman went down and gave his advice as to what ought to be done, and stated that no further accident was expected. He (Mr. Cross) was not able to say from any information before him at present that the mine should not have been stopped before the final burst of the water, but the Procurator Fiscal was making an independent enquiry into the whole circumstances of the

case, and he should wait until that enquiry was completed before taking further steps in the matter.—On Tuesday, in answer to a question by Mr. Macdonald with reference to an explosion in the Darcy mine, near Bolton, Mr. Cross said he believed it was an accident. He said that gas had accumulated before the explosion occurred. He said that it was as much to the interest of the owners of the mine as it was to that of the public that a public enquiry should be made. He had followed the course which was usual to him in such matters. He had given instructions that counsel on behalf of the Home Office should attend the inquiry.

COALS.

CONTRACT DEPARTMENT, ADMIRALTY, WHITEHALL, S.W., 10TH FEBRUARY, 1877.

TENDERS WILL BE RECEIVED until two o'clock on WEDNESDAY, the 28th February, for the SUPPLY of LAND ENGINE, STEAM, METAL MILLS, SMITHERY, COKE, BAKERY, and HOUSEHOLD COALS, to Her Majesty's Dockyards, Victualling Yards, Royal Marine Barracks, Naval Hospitals, &c.

The contracts are for specific quantities, and for forward delivery within stated periods. Tenders may be for the whole or any portion of the quantities required. Their Lordships do not bind themselves to accept the lowest or any tender, and reserve to themselves the power of accepting any part of a tender. Forms of tender, containing all particulars, may be obtained at this office on personal application; or by letter addressed "Director of Navy Contracts, Admiralty, Whitehall, S.W."

FRANCIS W. ROWSELL, Director of Navy Contracts.

SALE OF IRON CUTTINGS, PUNCHINGS, & TURNINGS, AT THE ROYAL ARSENAL, WOOLWICH. WAR OFFICE, 5, NEW STREET, SPRING GARDENS, S.W., 21ST FEBRUARY, 1877.

THE SECRETARY OF STATE FOR WAR IS PREPARED TO RECEIVE TENDERS for the PURCHASE of such IRON CUTTINGS, PUNCHINGS, and TURNINGS as may be for disposal during a period of three months, from the 1st January, 1877, at the Royal Arsenal, Woolwich, where Forms of tender and all information may be obtained, on application to the Senior Ordnance Officer. The tenders are to be delivered at the War Office, 5, New-street, Spring Gardens, S.W., by Twelve o'clock noon, on Friday, the 2nd day of March, 1877, addressed to the Director of Army Contracts, and marked on the outside "Tender for the purchase of Iron Cuttings, &c."

H. AYLMER GREENE, Director of Army Contracts.

MADRAS TRAMWAYS COMPANY (LIMITED). IN LIQUIDATION.

THE LIQUIDATOR IS PREPARED TO RECEIVE APPLICATIONS for the PURCHASE of this UNDERTAKING. For full particulars, apply to Mr. GEORGE BROOM, Liquidator, 53, Coleman-street, London, E.C.

THE IRON AND STEEL INSTITUTE. ANNUAL MEETING, 1877.

PRELIMINARY ANNOUNCEMENT.

THE ANNUAL MEETING will be HELD in LONDON, commencing TUESDAY, March 20th, 1877.

OUTLINE PROGRAMME.

TUESDAY, MARCH 20.—Annual Meeting for receiving Report of Council, election of Officers and Members, and for routine business.
WEDNESDAY, MARCH 21.—Inaugural Address of the President, C.W. Siemens, Esq., F.R.S., &c. Reading and discussion of papers.
THURSDAY, MARCH 22.—Reading and discussion of papers. Gentlemen desirous of contributing papers, or of introducing subjects for discussion, at this meeting are requested to give early notice to the undersigned. Owing to the lamented death of Mr. Forbes, some delay will unavoidably take place in issuing the next number of the Journal, but it is expected to be published in the course of a few weeks. The Council are open to receive communications from non-members. A detailed programme will be issued in due course.
JNO. JONES, General Secretary, Westminster Chambers, Victoria-street, London, S.W., Feb. 1, 1877.

BRITISH IRON TRADE ASSOCIATION. ANNUAL GENERAL MEETING, 1877.

THE BOARD OF MANAGEMENT hereby give notice that the FIRST ANNUAL GENERAL MEETING of the Association will be HELD in LONDON on FRIDAY, March 23rd, 1877. The Board will present a report of the proceedings of the Association since its establishment. Various subjects bearing upon the Iron and Steel Trades will be introduced for discussion, but before issuing the programme for the meeting the Board are desirous of ascertaining if any member wishes to read a paper, or to suggest a subject for discussion at this meeting. If so, particulars should be sent to the Secretary as early as possible. The Association is open to consider any subject that may be of National, as distinguished from local, importance to the Iron Trade in its several branches.
JNO. JONES, Secretary, Westminster Chambers, Victoria-street, London, S.W., Feb. 1, 1877.

BLACKWELL PARK RED HEMATITE IRON AND COAL MINING COMPANY, CARLISLE (LIMITED). A GENERAL MEETING of this company will be HELD at their office, 26, Broad-street, London, E.C., on MONDAY, March 5, at Four P.M.
By order, C. RICHARDS, Secretary. London, 22nd February, 1877.

PATENTS FOR INVENTIONS AT HOME AND ABROAD. REGISTRATION OF DESIGNS, TRADE MARKS, &c.

MR. ERNEST DE PASS,

PATENT AND REGISTRATION AGENT

(Successor to the late Mr. M. Henry).

FLEET CHAMBERS, 68, FLEET STREET, LONDON.

A Pamphlet of Information, containing full particulars, forwarded, post free, on application.

LEAD ORES.

Mines.	Tons.	Price per ton.	Purchasers.
Great Consols.	20	£13 0 6	—
Great Darren	14	20 5 0	—
12-Gilgawey	60	15 0 0	Weston, Son, and Co.
East Loggish	13	14 0 0	Panther Lead Company.
Cwmystwith	40	14 2 6	ditto
14-Great Laxey	100	24 9 0	Trefry's Estate.
15-Rhoswyl	20	13 10 6	—
20-Foxdale	110	22 6 0	Nevill, Druce, and Co.
De Broke	20	14 15 6	Burry Port Company.

BLACK TIN.

Mines.	Tons c. q. lb.	Price per ton.	Amount.	Purchasers.
Wheal Coates	4 13 2 15	£43 2 6	£201 19	1-Daubuz.

COPPER ORES.

Mines.	Tons.	Price.	Mines.	Tons.	Price.
Great Consols.	90	£8 0 0	Marke Valley	64	£4 11
ditto	20	2 1 0	ditto	69	3 9
ditto	80	2 10 0	ditto	35	2 3
ditto	75	2 7 6	ditto	33	3 2
ditto	73	2 7 6	ditto	24	5 1
ditto	64	2 4 6	Glasgow Caradon	75	4 5
ditto	60	4 9 0	ditto	74	3 13
ditto	59	4 8 0	ditto	65	5 0
ditto	60	6 11 0	ditto	89	3 1
ditto	43	7 5 0	Hington Down	89	2 5
ditto	46	6 9 0	ditto	66	3 3
ditto	31	0 17 6	ditto	31	3 2
ditto	29	2 4 6	ditto	23	2 13
ditto	27	2 4 6	Gawton	65	2 1 6
ditto	90	2 15 0	ditto	50	1 19 0
ditto	63	4 4 0	ditto	41	2 7 6
ditto	66	4 0 6	Phonix	80	5 16 6
ditto	60	4 15 0	East Caradon	73	4 10 6
ditto	55	5 1 6	ditto	47	4 8 6
ditto	60	6 10 6	Holmbush	55	0 3 0
ditto	41	10 12 0	ditto	20	3 9 0
ditto	39	10 5 0	Wheal Russell	73	2 10 6
ditto	90	3 11 0	Gaids Ore	4	2 13 6
ditto	72	3 6 0			

TOTAL PRODUCE.

Great Cons.	820	£3189	2 0	Phonix	120	£2 635	0 0
East Caradon	470	2659	11 0	East Caradon	120	538	0 0
Marke Valley	380	1364	3 6	Holmbush	73	57	5 0
Wheal Russell	270	1080	5 0	Wheal Russell	73	154	0 6
Hington Down	200	549	3 6	Gaids Ore	4	10	14 0
ditto	162	341	9 0				
Average price per ton	£106	2 0	Average produce	23	19	0	6%
Quantity of ore	2994	Quantity of fine copper	169 tons	17 cwts.			
Amount of money	£10,609	£10,609	0 0				

* The complete Ticketing will be published in next week's Journal.

VALUABLE SHARES IN THE BRITANNY MINERALS COMPANY (LIMITED).

MESSRS. RUSHWORTH, ABBOTT, AND RUSHWORTH WILL SELL, BY AUCTION, at the Mart, Tokenhouse-yard, E.C., on Wednesday, February 28, at One for Two, in Twelve Lots, THREE THOUSAND SHARES (of £1 each) in the

BRITANNY MINERALS COMPANY (LIMITED).

Comprising 1500 shares fully paid-up, and 1500 shares upon which 15s. per share has been paid.

Particulars may be had of Messrs. PARKER and BRAILS福德, Solicitors, Sheffield; of the Auctioneers, 22, Saville-row, W., and 19, Change-alley, E.C.; and at the Mart.

MINING PROPERTIES FOR SALE.—

SEVERAL bona fide BROWN HEMATITE, MANGANIFEROUS IRON, and SILVER LEAD MINES, situated in the Province of MURCIA, SPAIN, TO BE SOLD.

Apply to Sr. D. JOSE BOWYON, Del Comercio, Cartagena.

FOR SALE, at NEW PEMBROKE MINE, near PAR STATION, CORNWALL.

An excellent 80 in. cylinder PUMPING ENGINE, 12 ft. stroke in cylinder and 10 ft. in shaft, with cast-iron balance bob, and FOUR 12 ton BOILERS, in good condition.
ONE 25 in. DRAWING ENGINE, and TWO BOILERS.
ONE 20 in. STAMPING ENGINE, with three iron stamps' axes, carrying 32 heads, and TWO BOILERS.
Also, OTHER GOOD MINE MATERIALS.

Apply to—

MR. JOHN POLKINGHORNE, PAR OFFICE, PAR STATION.

FOR SALE, or LEASE, GALVANISED IRON and STONE

SHEETS, in SOUTH DOCK, SWANSEA, alongside Wharf and Rail, and suitable for Warehousing Metals, Minerals, Esparto, and other fibres, &c.

To view, apply to Mr. D. WILLIAMS, 36, Argyle-street, Swansea. For terms, to "A. B." Messrs. Pottle and Son, Royal Exchange Buildings, London, E.C.

SLATE QUARRY.

FOR SALE, a SLATE QUARRY, in NORTH WALES, in working order. The quality of the SLATE is GOOD, and the supply practically inexhaustible. Suitable either for private investment or for a company.

For full particulars, address, "Delta," MINING JOURNAL Office, 26, Fleet-street, London, E.C.

FOR IMMEDIATE SALE.—

A SLATE QUARRY. "ONE OF THE BEST SPECULATIONS IN ENGLAND." For particulars apply to "H. B. M." 17, Oxford-street, Newcastle-on-Tyne.

BRICKWORKS and COLLIERY.

TO LET, or SELL, a well-arranged modern BRICKYARD and SHEDS, KILNS, ENGINES, &c., all in full working order; together with COLLIERY and TUNNAGE COAL, near RUABON, NORTH WALES. Suitable for the Manufacture of Buff Building Bricks, Fire Bricks, Sanitary Tubes, &c.

Apply to Mr. H. B. DRANSFIELD, Surveyor, 10, King-street, Huddersfield.

SALE OF ARSENICAL ORES.

NOTICE IS HEREBY GIVEN, that the Directors of HOLMBUSH (LIMITED) are prepared to RECEIVE TENDERS for the PURCHASE of their FEBRUARY PARCEL of ARSENICAL ORES (estimated at about 600 tons), containing various Metals in addition to Arsenic.

The conditions of sale and Forms of Tender may be had on application to the company's agents, Messrs. H. G. Load and Co., 146, Palmerston Buildings, Bishopsgate-street, London, E.C.

By order of the Board, S. BOOME, Registrar.

SOUTH WALES.—IN CONSEQUENCE OF ILL HEALTH.

ON SALE, BY PRIVATE TREATY, VERY ELEGANT COLLIERY. Excellent seams of coal, house fire, steam, ironstone, fire and common clay, plant for brickmaking, railway sidings, &c.

To treat, address J. MARSDEN, 96, Deansgate, Manchester.

ON SALE:—

ONE 70 in. cylinder single acting PUMPING ENGINE.
ONE 30 in. ditto
ONE 22 in. WINDING ENGINE.
ONE 18 nominal horse power PORTABLE ENGINE.
Several CORNISH BOILERS, PITWORK, STRAPPING PLATES, CAPS, &c., and various other spare MINE MATERIAL. Also, one large BALANCE BOB.

Apply to—

WILLIAM TREGAY, REDRUTH, CORNWALL.

FOR SALE, a 18-horse power PORTABLE STEAM ENGINE,

with link motion reversing gear, ready for delivery.
A 25-horse power PORTABLE.
An 18-horse power VERTICAL STEAM ENGINE, with link motion reversing gear, also gear to wind and pump.
A 9 ft. PAN MORTAR MILL, VERTICAL ENGINE, and BOILER.

Apply to—

BARROWS AND STEWART, ENGINEERS, BANBURY.

FOR SALE, —A SEMI-PORTABLE STEAM-ENGINE, of

25-horse power, with two cylinders, in thorough repair; has only been in use a short time.
For particulars, apply to the makers, CLAYTON and SHUTTLEWORTH, Lincoln.

SULPHATE OF BARYTES FOR SALE.—

Fine powdered, beautifully white; also in the Rock or Crude State, free from Lime and Metallic Oxide.
Samples on application to—
RUTHWAITE BARYTES MINING COMPANY, WHITEHAVEN.
Nov. 17, 1875.

ON SALE, TWO CORNISH BOILERS, 30 ft. by 7 ft. diameter

Two fires through each. Safe at 60 lbs. pressure working.
Apply to HENRY PARKINSON, Foundry-street, Bolton.

ON SALE, ONE PAIR of 18 in. high-pressure HORIZONTAL

ENGINES, for winding, fitted with slot link motion. First-class pair of engines.
Apply to HENRY PARKINSON, Foundry-street, Bolton.

ON SALE, ONE PAIR of 15 in. HORIZONTAL WINDING

ENGINES, with slot link motion. Will be sold cheap.
Apply to HENRY PARKINSON, Foundry-street, Bolton.

ON SALE, ONE 25-horse power double cylinder PORTABLE

ENGINE, fitted with slot link motion for winding.
ONE 20-horse power double cylinder PORTABLE ENGINE.
Will be sold cheap, and are in first-class order.
Apply to HENRY PARKINSON, Foundry-street Boiler Works, Bolton, Lancashire

ON SALE, ONE 8-horse power PORTABLE ENGINE, fitted

up with winding drum; slot link motion; made by Clayton and Shuttleworth. Price £130.
Apply to HENRY PARKINSON, Foundry-street, Bolton.

ON SALE, ONE PAIR of 25 in. coupled HORIZONTAL

WINDING ENGINES, with drums and brake gear. Also ONE PAIR of 22 in. ditto. Will be sold cheap.
Apply to H. PARKINSON, Foundry-street, Bolton.

ON SALE, ONE strong well-built condensing BEAM ENGINE,

by a first-class maker, equal to new; cylinder 36 in. bore, 5 ft. stroke. Can be seen standing, and will be sold cheap. ONE close-built self-contained condensing BEAM ENGINE, stands on independent bed on six columns; cylinder 28 in. bore, 4 ft. stroke. As good as new. Can be seen standing, and will be sold cheap.
Apply to HENRY PARKINSON, Foundry-street, Bolton.

BOILERS ON SALE.—FOUR GALLOWAY'S PATENT

BOILERS, 30 ft. by 7 ft., safe to work at 70 lbs. on the square inch. TWO BOILERS, 24 ft. by 7 ft., with two fires through.
TWO BOILERS, 20 ft. by 7 ft., two fires through.
ONE BOILER, 18 ft. by 6 ft., one fire through.
Also several smaller sizes.
Apply to HENRY PARKINSON, Foundry-street, Bolton.

ON SALE, ONE 16 horse power double cylinder PORTABLE

ENGINE, for winding.
ONE 12 horse power PORTABLE ENGINE.
ONE 10 horse power PORTABLE ENGINE.
ONE 8 horse power PORTABLE ENGINE.
ONE 6 horse power PORTABLE ENGINE.
Equal to new, and will be sold cheap.
Apply to HENRY PARKINSON, Foundry-street, Bolton.

ON SALE, ONE PAIR of 25 in. horizontal WINDING ENGINES

ONE PAIR of 18 in. horizontal WINDING ENGINES.
ONE PAIR of 15 in. horizontal WINDING ENGINES.
ONE PAIR of 12 in. horizontal WINDING ENGINES.
ONE PAIR of 10 in. horizontal WINDING ENGINES.
ONE PAIR of 7 in. horizontal WINDING ENGINES.
The above engines are now ready for delivery, and fitted with winding drum and brake gear to each pair of engines.
Apply to HENRY PARKINSON, Foundry-street, Bolton.

THE PRINCE ROYAL MINING COMPANY (LIMITED).

Capital £20,000, in 10,000 Shares of £2 each.
5s. payable on allotment. Calls not to exceed 2s. 6d. each.

DIRECTORS.

J. H. COLLINS, Esq., F.G.S., Truro—CHAIRMAN.
WILLIAM ARGALL, Esq., Breage, Helston.
W. H. DUIGNAN, Esq., Rushall Hall, near Walsall.
SAMUEL GEORGE, Esq., M.E., Redruth.
L. W. LEWIS, Esq., Walsall.

SOLICITORS.

Messrs. DUIGNAN and SMILES, 15, Bedford-row, W.C.

BANKERS.

Messrs. WILLYAMS and Co., Miner's Bank, Truro.

This company is formed to acquire and work the Prince Royal Tin, Copper, and Lead Mine, held under lease from the Prince of Wales, in the parish of St. Agnes, near Perranporth, Cornwall. The set is very extensive, being about ¼ mile in length and 1 mile in width, and is situated in one of the best mineral districts in Cornwall. It is traversed by five known and well-defined lodes of tin and three of copper running east and west, all of which have been intersected by adit levels; two other most important lodes running north and south have recently been discovered—namely, a copper lode and a very promising silver-lead lode. The existence of the latter was not previously anticipated, but it now bids fair to be the principal feature in the mine.

The company acquire the mine (including the plant and loose stock) for £8000, being the sum actually expended upon it, and to show their absolute confidence in the undertaking the vendors take the whole of the purchase-money in deferred shares, not ranking for dividend until the ordinary shares have received 10 per cent.

Intending subscribers are invited to inspect the property, which is situated within eight miles of the Truro Railway Station. The following contract has been entered into by the company, and copies of it, and of the Memorandum and Articles of Association, may be inspected at the offices of the company's solicitors—"20th Jan., 1877: Agreement between Wm. H. Duignan and Lauriston Winterbotham Lewis of the one part, and the company of the other part."

Detailed prospectuses and reports, and forms of application for shares, may be obtained from any of the directors, or of the company's solicitors.

ABRIDGED PROSPECTUS OF BARNARD'S PROMOTERS' COMPANY (LIMITED).

Capital £250,000, in 250,000 Shares of £1 each, fully paid, with no further liability.

SECRETARY AND MANAGER—THOMAS JOHN BARNARD.

OFFICES.

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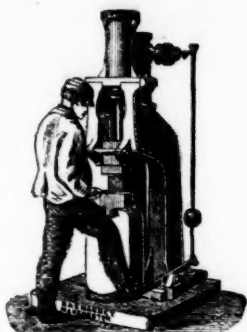
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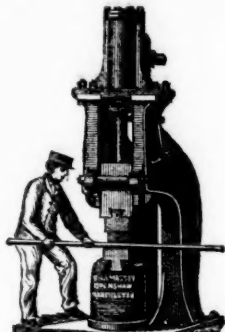
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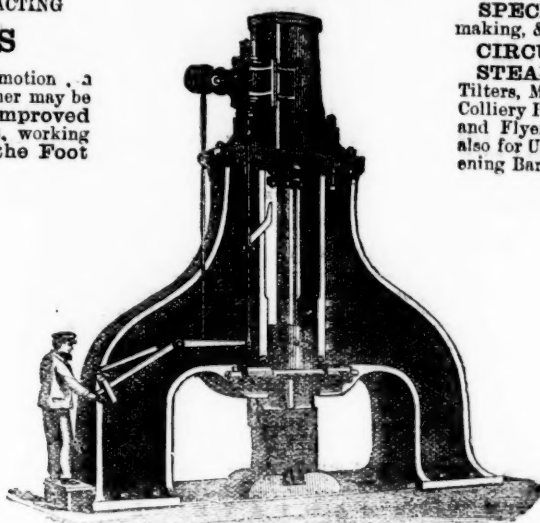
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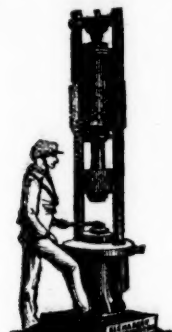
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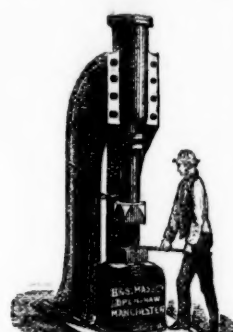
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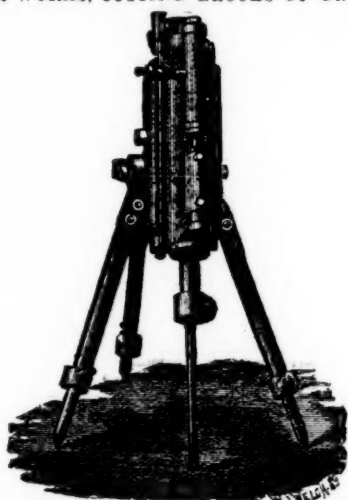
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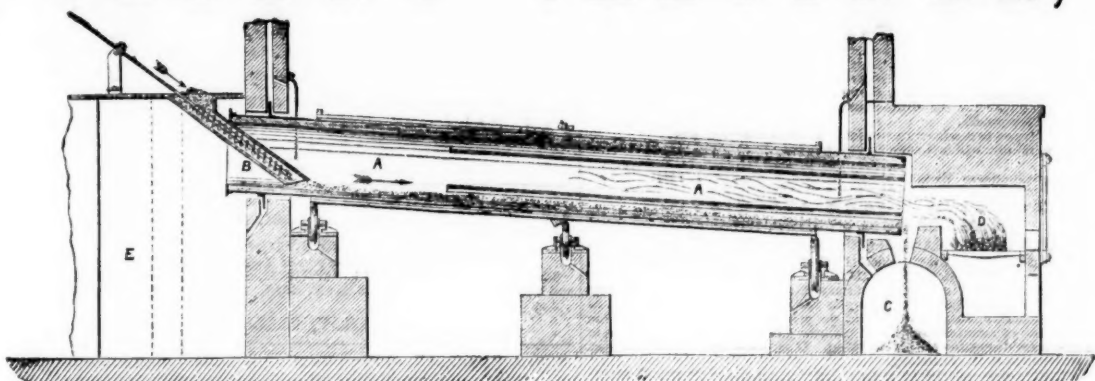
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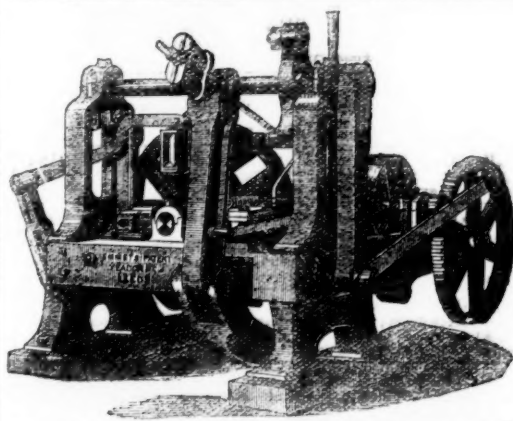
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12000	West Wye Valley, c, t, Montgomery	3 0 0	—	0 13 6	0 4 Nov. 1872
512	Wheel Bassett, c, t, Illogan	17 2 8	—	0 8 0	0 3 Nov. 1872
1024	Wheel Eliza Consols, c, t, St. Austell	20 0 0	—	0 9 0	0 4 Feb. 1872
2048	Wheel Killy, c, t, St. Austell	2 18 0	—	0 11 6	0 5 July 1872
4296	Wheel Killy, c, t, St. Austell	2 18 0	—	0 11 6	0 5 July 1872
80	Wheel Owles, c, t, St. Just	85 5 0	—	0 3 0	0 2 Dec. 1872
6000	Wheel Prussia, c, t, Redruth	2 0 0	—	52 9 0	0 26 Mar. 1872
25000	Wicklow, c, t, t, Wicklow	2 10 0	—	0 10 6	0 4 Oct. 1872
10000	Wye Valley, c, t, Montgomery	3 0 0	—		

FOREIGN DIVIDEND MINES.

Shares.	Mines.	Paid.	Last wk. Clos. pr.	Total Div. Per sh.	Last pd.
35500	Alamillos, c, Spain	2 0 0	—	1 15 2	0 1 Oct. 1872
30000	Almaden and Tinto Consols, c, t	1 0 0	—	0 6 3	0 1 May 1872
10000	Australian, c, South Australia	7 7 8	—	0 8 0	0 2 Aug. 1872
10000	Battle Mountain, c, t, 6240 part pd.	8 0 0	—	0 10 0	0 10 Nov. 1872
15000	Birdseye Creek, c, t, California	5 0 0	—	0 14 0	0 2 Dec. 1872
13200	Burns, c, t, South Australia	5 0 0	—	70 0 0	0 10 Nov. 1872
20000	Cape Copper Mining, c, t, So. Africa	7 0 0	—	26 15 0	0 1 Dec. 1872
40000	Cedar Creek, c, t, California	5 0 0	—	0 6 0	0 26 June 1872
15000	Chicago, c, t, Utah	10 0 0	—	0 2 0	0 4 Nov. 1872
21000	Colorado Terrible, c, t, Colorado	8 0 0	—	0 13 6	0 4 Nov. 1872
10000	Copago, c, t, Chili (250 shares)	15 15 0	—	2 8 0	0 2 Jan. 1872
10000	Don Pedro North of Rey, c, t	0 18 0	—	3 8 0	0 20 Mar. 1872
28800	Eberhardt and Aurora, c, t, Nevada	15 0 0	—	1 8 0	0 3 Dec. 1872
80000	Emma, c, t, Utah	2 0 0	—	3 18 9	0 2 Dec. 1872
70000	English and Australian, c, t, S. Africa	2 10 0	—	2 18 9	0 2 Dec. 1872
30000	Flagstaff, c, t, Utah	10 0 0	—	4 2 0	0 6 July 1872
25000	Fortuna, c, t, Spain	2 0 0	—	6 2 0	0 8 Oct. 1872
85000	Frontino & Bolivia, c, t, New Gran.	2 0 0	—	0 1 0	0 10 June 1872
80000	Gold Run, c, t, Idaho	1 0 0	—	0 2 4	0 4 Oct. 1872
80000	Kapunda Mining Co. Australia	1 30 0	—	0 14 0	0 6 July 1872
20000	Lead Chance, c, t, Utah	5 0 0	—	0 1 0	0 9 Oct. 1872
15000	Linares, c, t, Spain	5 0 0	—	0 1 0	0 9 Oct. 1872
80000	London and California, c, t	2 0 0	—	1 11 6	0 1 July 1872
7837	Lusitania, Portugal (25 shares)	3 10 0	—	0 6 0	0 6 Dec. 1872
8000	Mammoth Copperworks of Utah, c, t	10 0 0	—	0 4 0	0 4 Jan. 1872
8000	Mountain Chief, c, t, Utah	10 0 0	—	0 0 0	0 3 July 1872
18000	Prussian Mining & Ironworks, c, t	30 0 0	—	23 1 1	11 Nov. 1872
10000	Port Phillip, c, t, Chile	1 0 0	—	1 8 0	0 10 Jan. 1872
44000	Richmond, c, t, Nevada	10 0 0	—	0 2 0	0 16 Oct. 1872
40000	Santa Barbara, c, t, Brazil	0 10 0	—	17 1/2	per cent. Nov. 1872
120000	Scottish Australian Mining Co., New	1 0 0	—	1 16 0	0 2 Oct. 1872
80000	South Australian Mining Co., New	0 50 0	—	0 14 2	0 2 Nov. 1872
112500	Sierra Buttes, c, t, California	3 0 0	—	3 8 0	0 20 June 1872
60000	South Aurora, c, t, Nevada	8 0 0	—	0 11 0	0 8 May 1872
225000	St. John del Rey (25 stock and multiples dealt in)	280 310	—	12 per cent.	per an. July 1872
15000	Sweetland Creek, c, t, California	4 0 0	—	0 16 0	0 8 Sept. 1872
30000	Tolima, c, t, America	5 0 0	—		
25000	Victoria (London), c, t, Australia	1 0 0	—		
15000	Western Andes, c, t, New Gran.	8 0 0	—		
21000	W. Prussian (2500 pref. sh. 101 paid)	10 0 0	—		

NON-DIVIDEND FOREIGN MINES.

Shares.	Mines.	Paid.	Last wk. Clos. pr.	Last pd.
20000	Anglo-Australian, c, Victoria	2 10 0	—	Sept. 1872
5000	Anglia Phosphate, West India (4000 issued)	10 0 0	—	Fully pd.
10000	Argentine, c, Argentine Republic	5 0 0	—	5 5/8 Fully pd.
12000	Australian Central, c, t, (also 6000 deferred shares)	1 0 0	—	Fully pd.
3000	Bellavista, c, Peru (210 shares)	5 0 0	—	Fully pd.
30000	Blue Tent, c, t, Brazil	5 0 0	—	3 3/4 Fully pd.
80000	Braganza, c, t, Brazil	0 15 0	—	Fully pd.
12000	Camp Floyd, c, t, Utah	10 0 0	—	Oct. 1870
30000	Cesena Sulphur Company, Romagna, Italy	10 0 0	—	Oct. 1870
50122	Chontales, c, t, Nicaragua	2 0 0	—	Fully pd.
16000	Condes de Chili, c, t	5 0 0	—	5 1/2 Fully pd.
35000	Excelsior Hydraulic Gold Washing Co., California	5 0 0	—	Dec. 1871
100000	Exchequer, c, t, California	1 0 0	—	2 1/2 Fully pd.
40000	Holcombe Valley, c, t, California	10 0 0	—	Jan. 1873
8000	Hornos de Azufre, c, t, Spain	10 0 0	—	13 1/2 Fully pd.
90000	Imperial Brazilian Collieries, Brazil	5 0 0	—	Jan. 1873
100000	I. X. L., c, t, California	1 0 0	—	Fully pd.
60000	Javali, c, t, Nicaragua	2 0 0	—	1 1/2 Fully pd.
2500	La Mancha, c, t, Newfoundland	10 0 0	—	3 1/2 Fully pd.
12000	Llanos, c, t, Viscaya, Spain (25 shares)	1 15 0	—	Mar. 1876
7000	Malabar, c, t, Colombia (27145 shares)	1 0 0	—	Fully pd.
40000	Malpaso, c, t, Colombia (7400 pref. shares, fully paid)	1 0 0	—	Fully pd.
12000	Menéndez, c, t, Colombia	5 0 0	—	Fully pd.
6000	Monte Loretto, c, t, Italy	5 0 0	—	Fully pd.
4258	New Bendberg, c, t, Germany	5 0 0	—	Nov. 1875
60000	New Quebrada, c, t, Venezuela	5 0 0	—	3 1/2 Fully pd.
30000	New Zealand Kapanga, c, t, Comorandell	5 0 0	—	2 1/2 Fully pd.
3000	Oregon, c, t, Oregon, U.S. (preference shares)	4 0 0	—	Sept. 1875
80000	Panulillo, c, t, Chili (280000 debentures)	4 0 0	—	13 1/2 Fully pd.
80000	Pentarens United, c, t, Italy	3 0 0	—	3 1/2 Fully pd.
80000	Provincia and New Rosario, c, t, Mexico	1 0 0	—	Fully pd.
50000	Rica, c, t, Colombia (40000 issued)	1 0 0	—	Fully pd.
2,181,000	Rio Tinto, c, t, Spain	1 0 0	—	66 3/4 Fully pd.
100000	Rosa Grande, c, t, Brazil (21 shares)	Stock	—	Fully pd.
30000	Russia Copper, Orenburg and Ufa	10 0 0	—	2 1/2 Fully pd.
25000	San Pedro, c, t, Chili	2 0 0	—	2 1/2 Fully pd.
10000	Silver Plume, c, t, Colorado	1 0 0	—	1 1/2 Fully pd.
7500	Snowdrift, c, t, Colorado	2 0 0	—	Fully pd.
30000	Tecoma, c, t, Utah	10 0 0	—	3 1/2 Fully pd.
20000	Thornhill Reef, c, t, Australia	1 0 0	—	Fully pd.
43174	United Mexican, c, t, Mexico	25 15 3	—	May 1875
14000	Utah, c, t, Utah	5 0 0	—	Fully pd.
75000	Yorke Peninsula, c, t, South Australia	5 0 0	—	Fully pd.
40000	Yorke Peninsula, c, t, South Australia	1 0 0	—	1 1/2 Fully pd.

FOREIGN AND MISCELLANEOUS STOCKS, BONDS, LOANS, AND TRUSTS.

Closing Prices.	Closing Prices.
Argentina, 1868, 6 per cent.	70 72
Bolivia, 6 per cent.	18 20
Brazilian, 1868, 5 per cent.	95 97
Chilian, 1868, 5 per cent.	101 104
City of Providence, 5 p.c. coupon bonds	97 99
Egyptian, 1862, 7 per cent.	47 49
Do., 1868, 7 per cent.	48 49
Do., 7 per cent, V.M.L.	61 65
Do., 9 per cent, guar.	71 75
Do., 7 per cent, K.M.L.	37 39
Foreign and Col. Gov. Trust, 5 p. cent.	68 73
Do., 5 per cent, 2d issue	51 52
Do., 1872, 4th issue	57 58
Do., 1875, 5th issue	52 55
Peruvian, 1870, 6 per cent.	15 18
Do., 1872, 5 per cent.	15 15 1/2
Russian, 5 1/2 per cent. L. Mort.	72 75
Spanish, Quiksilver Mort. 5 p. cent.	92 94
United States Mort. 6 per cent.	94 95 1/2

NON-DIVIDEND MINES.

Shares.	Mines.	Paid.	Last wk. Clos. pr.
40000	Aberdunant, c, t, Llanidloes	1 0 0	1 1/2
10000	Aberystwith, c, t, Cardigan	5 0 0	—
2500	Alvig & Burg, c, t, St. Aust. (31 sh.)	2 10 0	—
15000	Ambleton, c, t, e, Liskeard	1 18 0	—
10000	Ambleton, c, t, Carnarvonshire	5 0 0	1 1/2
50000	Ballycummick, c, t, Schull	2 0 0	—
12000	Bedford United, c, t, Tavistock	1 17 6	—
25000	Belstone, c, t, Devon (27,000 ly. pd.)	1 0 0	2 1/2
15000	Blanc United, c, t, Cardigan	1 0 0	1 1/2
3937	Bine Hills, c, t, St. Agnes	3 5 0	—
6000	Bodidra, c, t, Denbighshire	1 0 0	1 1/2
2000	Bowden Hill, c, t, m	1 0 0	—
6000	Bradwell Moss Rake	1 0 0	1 1/2
70000	Calbeck Fell, c, t, Cumberland	2 0 0	—